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Multi-Variable Comparison of Structural Reading Program and an Enriched Basal Reading Program With Disadvantaged Urban Children. Final Report.

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This exploratory multivariable comparison of an augmented structural (Stern and Gould) and an enriched basal (Winston) program was conducted with two matched classes of low to average ability disadvantaged children in grades 1 and 2. At the end of grade 1 the basal class rated significantly superior on the Gates-MacGinitie Comprehension Test and the California Test of Mental Maturity. The structural class rated significantly superior on the Structural Reading Achievement Test and in the number of words written on the writing sample. At the end of grade 2 ,significant differences favored the structural class in spelling ability and in the desire to write words and stories instead of to color pictures. Analysis of covariance, with mental ability controlled, showed the structural class to be equal or superior on most measures of the study. Consistent findings favoring the structural class in reading and writing samples were confirmed by a study of the progress of the lowest five readers in each class. The researchers inferred that the growth of the structural class in language components and their favorable academic work habits suggested that the structural method provided a stronger foundation in language skills for these disadvantaged children. References and appendixes are included. (BS)

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U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Authors: Dr. Adella C. Youtz
Dr. Lillian R. Putnam

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Newark State College

Union, New Jersey

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Miss N.E. Liss	-- Vice-Principal, 18th Ave. School
Mrs. Fanny Rose	-- Reading Consultant for Teacher Training
Mrs. Patricia Tetta	-- Teacher of the Structural Class
Mrs. Edwina Davis	-- Teacher of the Basal Class

V. Introduction

A. The Problem

The present method of teaching beginning reading to urban disadvantaged children is proving to be inadequate. Culturally deprived children lack the ability to make effective use of the word recognition processes emphasized in the Basal readers. Even with enrichment, phonic supplements and integrated illustrations, it appears that the Basal reading programs are inadequate in developing the needed audio and articulative skills and self confidence as an integral part of the reading process. Consequently, Basal reading programs fail to promote a variety of attitudes, interests and intellectual stimulations which should develop as a result of an inner sense of power to learn effectively.

B. Background and Review of Related Research

There are many weaknesses in the word recognition approach of teaching beginning reading to disadvantaged children. The Basal method is based upon a half century of research. It seems to confirm that (1) a meaningful approach to word recognition is superior to a phonic approach which uses non-meaningful units, (2) a wealth of available reading materials allows children to pursue individual interests in early reading, (3) repeated exposure to controlled vocabulary provides over-learning.

There is, however, no solid body of research data which supports the superiority of the following features, commonly included in the Basal method: (1) the acquisition of a sight vocabulary of seventeen to thirty words prior to the introduction of phonic instruction, (2) the use of pictures to identify the sight words, (3) the timing and sequence of phonic skills as presently presented in Grades I and II, and (4) the analytic and/or eclectic approach to word recognition. In fact, a recent review of research by Chall indicates that the code emphasis is the better way to start the reading process and that systematic phonics is probably more effective because it can be made easier than intrinsic phonics (1). Gibson states that learning to read by letters has more transfer value than by whole words, because the whole word method leaves the student to analyze for himself the component relationships. Disadvantaged children do not make this analysis or see these relationships because of their linguistic and auditory deficiencies (2).

Other serious weaknesses exist in the Basal method:

1. Early word recognition is based upon total configuration or upon the child's perceived "cue" which may represent only a small portion of the actual word. When the vocabulary load increases, the child resorts to guessing since his own mediating processes do not give him sufficient clues to identify new words or to classify them.

2. Word identification is often entirely dependent upon a picture. Even when integrated illustrations are presented, this process is dubious and limited because of the lack of transfer to new words.

3. The teaching of vowel sounds is usually deferred until Grade II. This encourages guessing and an over-emphasis upon context clues to fill the vacuum. It also discourages more suitable analytic skills and reduces the child's confidence.

4. The high mobility rate of disadvantaged children is a known fact. Children who transfer to schools using other Basal series are confronted with different sight vocabularies and are forced into extensive guessing and discouraging errors. Early failures may increase the anxiety of the child or produce reluctant participation in academic activities. The Grimes-Allinsmith study showed that the highly anxious and compulsive child does significantly better as he learns to read by a structured phonic method (3).

5. Many studies note that disadvantaged children have auditory deficiencies which impede the beginning reading process (Raph 4). It has been inferred that reading can best be learned by relying upon a child's strengths, i.e., visual abilities and motor skills in the case of disadvantaged children. This assumption is justified in a clinical case where serious sensory disorder may set limits to auditory functioning. But in the case of the disadvantaged children whose auditory handicaps result from inexperience or adaptation to excessive noise, their auditory weaknesses should not constitute a reason for using a method which emphasized the visual approach. Such a visual approach can do nothing to correct the auditory handicaps. The disadvantaged child needs the opportunity to learn auditory skills in the classroom far in excess of that presented in the Basal method. Studies by De Hirsch show that the child with poor auditory and visual perception needs the reinforcement and stimulation of as many pathways as possible (5).

6. Disadvantaged children in the New York -- Newark areas have articulation problems. Not only do they have a limited early language experience, except in the mastery of commands and threats (Bernstein 6), but the language is spoken with muffled consonants, a modified southern dialect, and an active vocabulary not found in

the dictionary. Current thought now stresses holding the language intact for primary communication and interaction. The language of the classroom now becomes the second language (N.C.T.E. Task Force Report 7).

7. The articulation and auditory disabilities of disadvantaged children have serious educational consequencies. The children's muffled speech serves them well in communication at close range, with their peers. But until more precision in speech develops, they will continue to have problems communicating across the classroom and with their teachers. To an increasing degree over the years, effective education is dependent upon children being able to share their opinions, questions, and information. The lack of active participation over a long period of time results in poor education and numerous drop-outs. This concept concurs with Bruner's idea that language is basic to thinking. He describes Martsinovskaya's experiment in which children were unable to follow the directions in a perception experiment. This occurred because they were unable to encode the instructions in internal language in a fashion that would permit them to regulate their own behavior. He maintains that if there is suitable internal language, the task can be done (8).

8. If learning this second language is deferred until the middle grades, children develop great resistance to it. They see no need for it and feel foolish practicing speech which is not an "in" language for them.

9. Even when supplemented and enriched, the usual Basal methods create conditions which hamper learning. When even a few children are seriously frustrated, a chain reaction occurs so that classroom disorganization sets in. The teacher may be forced into desperate efforts to control the class and a climate of negative comments and pupil retaliation develops. If the teacher maintains firm control of the class, the aggressive child may still become a focus of misbehavior. In such a climate, the number of non-participants grows. These problems occur when large numbers of transients join the class. New members from Puerto Rico, Cuba, or the south, who have language difficulties become only marginally involved in the ongoing learning.

These composite weaknesses of the Basal method can be alleviated by teachers who understand the problems and devise ways of correcting them. Few teachers are able to do this. Therefore, the investigators sought a method which might avoid the weaknesses of the Basal method and correct the particular deficiencies of the disadvantaged urban child. The Structural Reading Series by Stern and Gould, published by L.W. Singer, was selected as one that might accomplish the goals more effectively than the Basal Series now in use (9).

The Structural Reading Series was selected because it had the following advantages for teaching disadvantaged children:

1. It makes the assumption that the English language has enough consistent phonetic structure to permit a child to discover the word analysis clues which hasten competence in reading.

2. If a child learns to read without guessing, he will acquire "discovery" skills, self respect and a sustained interest in achieving at his own rate.

3. The "programming" of steps is carefully organized to facilitate sequential learning and to enable a transient or absentee to find "his place" and maintain continuity in learning.

4. It has avoided the psycholinguistic hazard of the usual phonetic approach. Consistent discrimination in the early stages of reading is made possible by forming "word parts", using the initial consonant and medial vowel, and then adding the final consonants to retain their psycholinguistic integrity. This contrasts with the initial consonant and word family approach of the typical phonic program.

5. Precision of articulation and auditory discrimination which are desperately needed, are stressed in this program.

6. Stern and Gould cite preliminary research data showing that compared with a Basal program, the Structural Reading Program left fewer children in the very low levels of reading achievement. The matching of these groups was so informal that further study was needed. Although Sheldon's Study showed little advantage in the Structural Reading Series during the first year, there is reason to question the adequacy of the training of his teachers for this method. His report focused on a heterogeneous population, not the disadvantaged group used in the study (10).

C. Purpose of the Study

The issues outlined above are critically important in the improvement of education of disadvantaged children. The informal evidence suggested that a major study on these issues was due. The purpose of this study was:

1. To conduct a pilot project to explore the effectiveness of an augmented Structural Reading Series for urban disadvantaged children, in comparison with an enriched Basal program (Winston), in beginning reading.

2. To investigate the possibility of a larger research on certain aspects of a disadvantaged child's early reading experiences which become critically related to his later educational progress.

3. To explore certain psycholinguistic, cognitive, and motivational variables as auxiliaries in the learning of reading, writing, and spelling.

D. Hypothesis

Low achievers in a disadvantaged urban population would make better progress in reading and related language skills through the program provided by the augmented Structural Reading Series by Stern and Gould than through the enriched Basal Program currently in use in Eighteenth Avenue School, Newark, New Jersey.

VI. Method

The pilot study of two first grade classes in the Eighteenth Avenue School, Newark, New Jersey was made, to see if any distinctive values resulted from the augmented Stern and Gould Series. One class was taught with the enriched Winston Basal Readers, and a matched class with the Structural Reading Series. The teachers of both groups endeavored to provide the best educational experiences within the prescribed methods.

A. Matching of Classes

Seven first grade classes were arranged in order of predicted success in reading. Predictions were based on Kindergarten teacher's ratings and the Lee-Clark Reading Readiness Test given in May prior to first grade entrance (12). In the school organization, class 1 had the highest ability with class 7 at the lowest level. The fifty-four children in classes 4 and 5 were reassigned to the experimental and control classes of the study. They were matched in sex, chronological age, Reading Readiness Scores, teacher ratings, and intact families (Father listed)(12). No I.Q. scores were available at that time.

Eighteenth Avenue School is located in the center of urban industrial Newark, and serves an all Negro neighborhood where one quadrant of the population live in municipal housing.

B. Teachers

Experimental Group -- Mrs. Patricia Tetta
Control Group -- Mrs. Edwina Davis

Both teachers had the services of a professional consultant. Mrs. Tetta had Mrs. Toni Gould, co-author of the Structural Series, and Mrs. Davis had Mrs. Fanny Rose, former principal and supervisor in the Newark schools.

Both teachers were recommended by the administrative officers for their ability to establish good relationships with children in their classes, and to plan effective sequences of learning for their pupils.

Because the Structural Method was a completely new procedure and the teacher was less experienced, considerable time was spent by the consultant in giving demonstrations and in conference with the teacher. The control group, whose teacher was highly experienced, needed less professional assistance, but it was available when needed or requested.

C. Procedure

Each class was taught by the same teacher by the respective methods from September 1966 -- June 1968. The control Basal method was enriched by use of films prepared by the school principal, by phonic supplements, and by additional trade books.

The experimental class adhered strictly to the method outlined in the Structural Reading Series, although supplementary practice sheets were prepared by the author and the teacher.

Approximately 25 supplementary work sheets were prepared for Book A, 50 sheets for Book B, and 60 sheets for Book C. These sheets were used for independent study and enrichment during periods of time when the teacher was conducting oral work with other small groups. These sheets resemble the Structural Reading Achievement Test in the Appendix.

Periodic observations were made by the investigators equally in both classes. In June 1967, the following tests were administered to both classes by an impartial research worker:

1. Gates-MacGinitie Reading Tests, Primary A, Form I (13)
   Vocabulary
   Comprehension

2. California Test of Mental Maturity, Short Form S (14)

3. Writing Sample -- derived from a picture stimulus
   Form I (Structural oriented)*
   Form II (Basal oriented)*

4. Gould Structural Reading Tests -- B^1 and B^2 (9)
   Vocabulary*
   Sentence Reading*
   Comprehension*

5. Putnam Composite Spelling Test -- Grade I* (15)
   Sub-units include words that are:
   a. common to both reading programs
   b. phonetically regular
   c. selected from the Dolch Basic Word List -- not necessarily phonetic

6. Youtz-Habas Attitude Interview* (16)
   A stick-figure based picture-interview on attitudes towards reading and other school tasks.

* Indicates assessment measures created for this project. See attached copies in Appendix.

The findings indicated that the study should be continued through Grade II. This occurred because the Structural Reading Series spends the first few months on development of meaning, precision of articulation, and auditory discrimination. Thus it takes longer to achieve a level where a realistic reading achievement score can be demonstrated. Thus the study was continued through Grade II, with the same teachers participating in each class. Typical mobility of the population occurred so that seventeen of the original twenty-seven pupils finished the Grade II program and were available for final testing June 1968.

Nine additional pupils who had suffered a disorganized class and had failed to progress in Grade I in the traditional Basal program were added to the experimental class in Grade II. This placed an added teaching load upon the teacher of the experimental class. One low-achieving child was added to the Basal group along with two transfer pupils.

These additional tests were administered to both experimental and control classes by the same impartial research worker during the second year of the project.

1. Gates-MacGinitie Reading Tests, Primary A, Form II (17)
   Vocabulary
   Comprehension

2. Putnam Composite Spelling Tests -- Grade II

3. Illinois Test of Psycholinguistic Abilities (1961) -- Individually administered (18)
   a. Auditory-Vocal Association Test
   b. Visual Motor Sequencing Test
   c. Auditory-Vocal Sequencing Test
   d. Auditory Decoding Test

4. Block Design -- Wechsler Intelligence Scale for Children -- Individually administered (19)

5. Kent-Emergency Scales of Intelligence -- Individually administered (20)

6. Selected items from the Youtz-Habas Attitude Interview (16)

A consistent effort was made to minimize the possible Hawthorne effects:

1. Both teachers had the services of a professional consultant.

2. The investigators held periodic conferences with both teachers and visited both classes equally.

3. The experimental class was taken to the A.V. Studio of Hunter College where a non-rehearsed film was made of the teaching procedures. The control group was taken to Newark State College for a tour and to give a demonstration lesson before a student audience which was video-taped.

4. Although discouraged by the investigators, additional visitations were made to the experimental class by interested teachers and the A.V. Studio staff.

5. There was no way to assess the influence of informal teacher conversation.

VII. Results

A. Final Comparability of Experimental and Control Classes

At the end of the research period when both experimental and control classes had completed Grade II, there remained only 17 children in each group. Other children had been added so that the total classroom situation involved 25 to 30 children during Grade II (table I). The added children were not included in the final study.

Comparison of Experimental and Control Groups -- Measures of Mental Ability

A further assessment of the comparability of the two classes was made on the bases of measures of mental ability. The results of the California Test of Mental Ability and two individually administered tests are presented in Table II.

Table I — Comparability of Experimental and Control Classes

	Experimental Class (Structural Method)	Control Class (Basal Method)
No. of Children	17	17
Boys	7	10
Girls	10	7
Age -- Mean on May 15,1968	8-0	8-1
Age at Beginning Grade I (Sept. 15,1966)	6-4	6-5
No. of Families -- Father absent	4	5
Kindergarten Teacher Rating*	1.94	1.75
Initial Reading Readiness Score (Lee-Clark, California Test)	Mn 46.11 S.D. 5.29	Mn 47.40 S.D. 6.71

* Rating -- 1 - High
2 - Average
3 - Low

Table II

	Mental Ability Tests			
	California Test of Mental Maturity (May 1967)			
	Language I.Q.	**Non-Language I.Q.**	**Total**	
Experimental Class (N=17)	Mean 91.61 S.D. 13.89	Mean 91.70 S.D. 8.89	Mean 91.30 S.D. 9.69	n.s.
Control Class (N=17)	Mean 93.84 S.D. 16.37	Mean 100.36 S.D. 10.49	Mean 96.72 S.D. 11.96	
	California Test of Mental Maturity -- T-Scores (Local Norms)			
	Language (T-score)	**Non-Language (T-score)**	**Total (T-score)**	
Experimental Class (N=17)	Mean 46.71 S.D. 9.05	Mean 46.82 S.D. 7.68	Mean 46.35* S.D. 7.28	t=3.34 p=<.01 level of confidence
Control Class (N=17)	Mean 55.24 S.D. 9.59	Mean 54.35 S.D. 9.96	Mean 54.71* S.D. 7.56	
	Kent Emergency Scale (T-score) (November 1967)			
Experimental Class (N=17)	Mean 47.94 S.D. 7.41			n.s.
Control Class (N=17)	Mean 50.12 S.D. 11.96			
	Block Design (T-score) of WISC (November 1967)			
Experimental Class (N=17)	Mean 48.06 S.D. 10.15			n.s.
Control Class (N=17)	Mean 50.71 S.D. 10.78			

*Difference in CTMM scores are consistently in favor of the control class. The greatest difference is seen when the I.Q. scores are converted to Local normalized T-scores based on the available tests given at Eighteenth Avenue School.

1. The children of the control class, in accordance with the Reading Readiness results, are consistently superior to the experimental class whether the measure of mental ability is group administered or individually administered. In the case of the California Test of Mental Ability the control class is significantly ahead of the experimentals.

2. The disadvantaged children of this study average in the low normal range of mental ability. The lowest child in the experimental class earned an I.Q. of 66 on the C.T.M.M., while the lowest C.T.M.M. I.Q. in the control class was 81.

3. The two individually administered short-tests of ability, the Kent and the Block Design were added because the experimenters questioned the validity of the C.T.M.M. as the sole determiner of mental ability for the comparisons of the study: (a) It calls for abilities which are emphasized in the Basal program, e.g., guessing, (b) Disadvantaged children are less familiar with pictures and objects of this test, (c) the processes in the Basal reading may develop the abilities measured by the C.T.M.M., (d) the Kent and Block Design Tests would be less influenced by the emphasis of either of the reading programs.

In view of these results it became necessary to report comparative Mental Ability results along with group comparisons of reading and language skills. It also became necessary to develop a coveriance analysis of selected data so that comparisons between adjusted means with mental ability controlled would be possible. Finally, a composite measure of mental ability, using the C.T.M.M., Language and Non-language, the Kent and the Block Design, was developed by converting each measure to normalized T-scores and then combining by averaging. The group comparison on the Composite Mental Ability T-score follows:

Table III

Comparison of Experimental and Control Classes
On T-Scores of Composite Mental Ability

	Mean	S.D.	S.E.M.	Diff.	t
Experimental class (N=17)	47.0	5.6	1.38	$M_{\bar{x}} - M_{\bar{c}}$ 5.76	2.896*
Control Class (N=17)	52.8	5.8	1.42		

* P=<.01 level of confidence

B. Comparison of the Two Groups on Reading Tests

1. Gates-MacGinitie Test -- June 1967 -- Grade I

This well known standardized Test of Primary Reading Abilities is built on vocabulary characteristic of the Basal reading program. As was expected, the children in the Basal program were significantly superior to those in the Structural Program when the influence of group differences in mental ability were not taken into account. (Table IV). When the mental ability factor is controlled by analysis of covariance the two groups are not significantly different on the Vocabulary Test (Table IV). The Control group, however, remains significantly better on the Reading Comprehension measure even after the removal of the influence of mental ability (Table V).

Table IV

Gates-MacGinitie Reading Tests

Comparison of Observed Mean Standard Scores and Adjusted Means*

	Experimental Class (N=17)		Control Class (N=17)	
1968 Primary B Form I Grade II	Vocabulary		Vocabulary	
	Observed Mean	41.53	Observed Mean	43.18
	S.D.	9.11	S.D.	7.48
	Adjusted Mean	43.03	Adjusted Mean	41.70
	Comprehension		Comprehension	
	Observed Mean	38.65	Observed Mean	39.70
	S.D.	7.22	S.D.	9.17
	Adjusted Mean	39.72	Adjusted Mean	38.67
1967 Primary A Form I Grade I	Vocabulary		Vocabulary	
	Observed Mean	33.41	Observed Mean	38.53
	S.D.	2.42	S.D.	7.93
	Adjusted Mean	34.0	Adjusted Mean	37.90
	Comprehension		Comprehension	
	Observed Mean	29.17	Observed Mean	40.88
	S.D.	7.07	S.D.	9.70
	Adjusted Mean	30.10	Adjusted Mean	40.10

*Means adjusted through Analysis of Covariance to control the factor of mental ability. F tests in 1968 comparisons not significant while F tests on 1967 data show significance $P < .05$ level.

Analysis of Covariance -- Gates-MacGinitie Vocabulary Standard Scores with Composite Mental Ability T-Scores Controlled

Table V

Vocabulary -- Grade I -- 1967

	df	Σx^2	Σxy	Σy^2	df	$\Sigma y'^2$	Mean Square
Among Means	1	283	250	220	1	1079.0	1079.0
Within Groups	32	1073	256	1109	31	61.1	1047.9
Total	33	1356	506	1329	32	1140.1	

F=1.030 $F_{.95}(1,40) = 4.17$ not significant

Without mental ability controlled F = 6.35 P = <.05 level of significance.

Vocabulary -- Grade II -- 1968

	df	Σx^2	Σxy	Σy^2	df	$\Sigma y'^2$	Mean Square
Among Means	1	283	81	24	1	21	21
Within Groups	32	1073	634	1514	31	1140	35.6
Total	33	1356	715	1538	32	1161	

F= .59 $F_{.95}(1,40) = 4.17$ not significant

Without mental ability controlled F=.21 not significant.

Analysis of Covariance -- Gates-MacGinitie Comprehension Standard Scores with Composite Mental Ability T-Scores Controlled

Table VI

Comprehension -- Grade I -- 1967

	df	Σx^2	Σxy	Σy^2	df	$\Sigma y'^2$	Mean Square
Among Means	1	283	573	1165	1	646	646
Within Groups	32	1073	357	2464	31	2345	76
Total	33	1356	930	3629	32	2991	

F=8.5 $F_{.95}(1,40) = 4.17$ P=<.05 level of confidence

Without mental ability controlled F = 8.84 P=<.05 level

Comprehension -- Grade II -- 1968

	df	Σx^2	Σxy	Σy^2	df	$\Sigma y'^2$	Mean Square
Among Means	1	283	52	8	1	9.4	9.4
Within Groups	32	1073	435	2501	31	2324.7	74.99
Total	33	1356	487	2509	32	2334.1	

F= .12 $F_{.95}(1,40) = 4.17$ not significant

Without mental ability controlled F=.10 not significant

2. Structural Reading Achievement Test at end of Grade I

Since the Gates-MacGinitie test was built on the Basal vocabulary, it became necessary to develop an informal reading test which was appropriate for the children trained in the Structural Program.* This test was made up of three units (1) Word Comprehension, (2) Sentence Comprehension, and (3) Paragraph Comprehension. (See Appendix I). The combined scores were converted to T-scores based on the entire population of first grade children to whom the test was administered.

Table VII

Comparison of Groups on Structural Reading Achievement Test

	Mean	S.D.	S.E.M.	T.
Experimental Group (N=17)	54.29	6.55	1.58	2.49*
Control Group (N=17)	45.29	8.99	2.18	

* P=<.05 level of significance

As was expected when the reading test employed vocabulary based on the Structural teaching method, the experimental class was significantly better than the control class.

*This test was developed by the author of the Structural Reading Series. Mrs. Toni Gould.

3. Gates-MacGinitie Test -- June 1968 -- Grade II

At the end of the second grade no significant differences were found between the groups either in Vocabulary or Comprehension. Table III show that when the means are not adjusted for the influence of mental ability, the control group is very slightly ahead of the experimental group on both measures. However when, through analysis of covariance, the means are adjusted for the mental ability factor, the experimental group moves to a position slightly above the controls. In neither case was the difference significant (Table V and Table VI).

4. Structural Reading Achievement Test

There was no Structural Reading Achievement Test available for Grade II. However, the Grade I test was again given to the five lowest readers in each class. Table VIII shows that the children in the Experimental sub-group achieved higher scores than did those in the control sub-group. This is consonant with our hypothesis, that this program would assist the low achievers more than the Basal program.

Table VIII

Structural Reading Test
Comparison of Lowest Five Readers
Grade I 1967 -- Grade II 1968

	Experimental Group (N=5)	Control Group (N=5)
1967		
Word Comprehension	Mean 9.2	5.8
Sentence "	Mean 11.0	8.6
Paragraph "	Mean 5.0	3.2
1968		
Word Comprehension	Mean 10.0 (Maximum Score)	8.6
Sentence "	Mean 13.2	10.6
Paragraph "	Mean 6.6	4.0
Composite Reading Score	Mean 35.9 S.D. 9.9	31.2 7.7

5. Reading Progress of the Lowest and Highest Five Readers in Each Group.

According to the initial hypothesis of the project, the characteristics of the Structural Reading Program would create a more adequate foundation for low-achieving disadvantaged children. Although all children in this study could be classified in this group, the five lowest were selected for group comparisons. The five highest achievers were selected for contrast. (Achievement was based on the Gates-MacGinitie Comprehension Test -- June 1968)

The Gates-MacGinitie Comprehension Test Scores were converted to T-Scores based on the population of second grade children who had taken the Gates-MacGinitie test. This T-Score conversion was necessary so that the reading scores could be visually compared with the Composite Mental Ability T-Scores of this same population. These results are presented in Figure I and Table IX.

The lowest five of the Structural Reading Experimental class had average comprehension scores somewhat higher than the lowest group in the control class although the control sub-group was of slightly superior mental ability. This finding is consonant with the hypothesis. It was evident that the low sub-group of the experimentals was achieving at a level more commensurate with their mental ability than was the low sub-group of the control class.

The highest five achievers of each group scored at levels higher than their mental ability T-Scores. There is no evidence that the experimental program penalized the highest achievers when their progress is compared with their mental ability.

When similar comparisons were made on the Vocabulary measure, no difference between the lowest sub-groups of the two classes were found in achievement although the control sub-group remains somewhat superior in mental ability.

Figure I

Comparison of Subgroups from Experimentals and Controls

Low-five Readers and High-five Readers - 1968

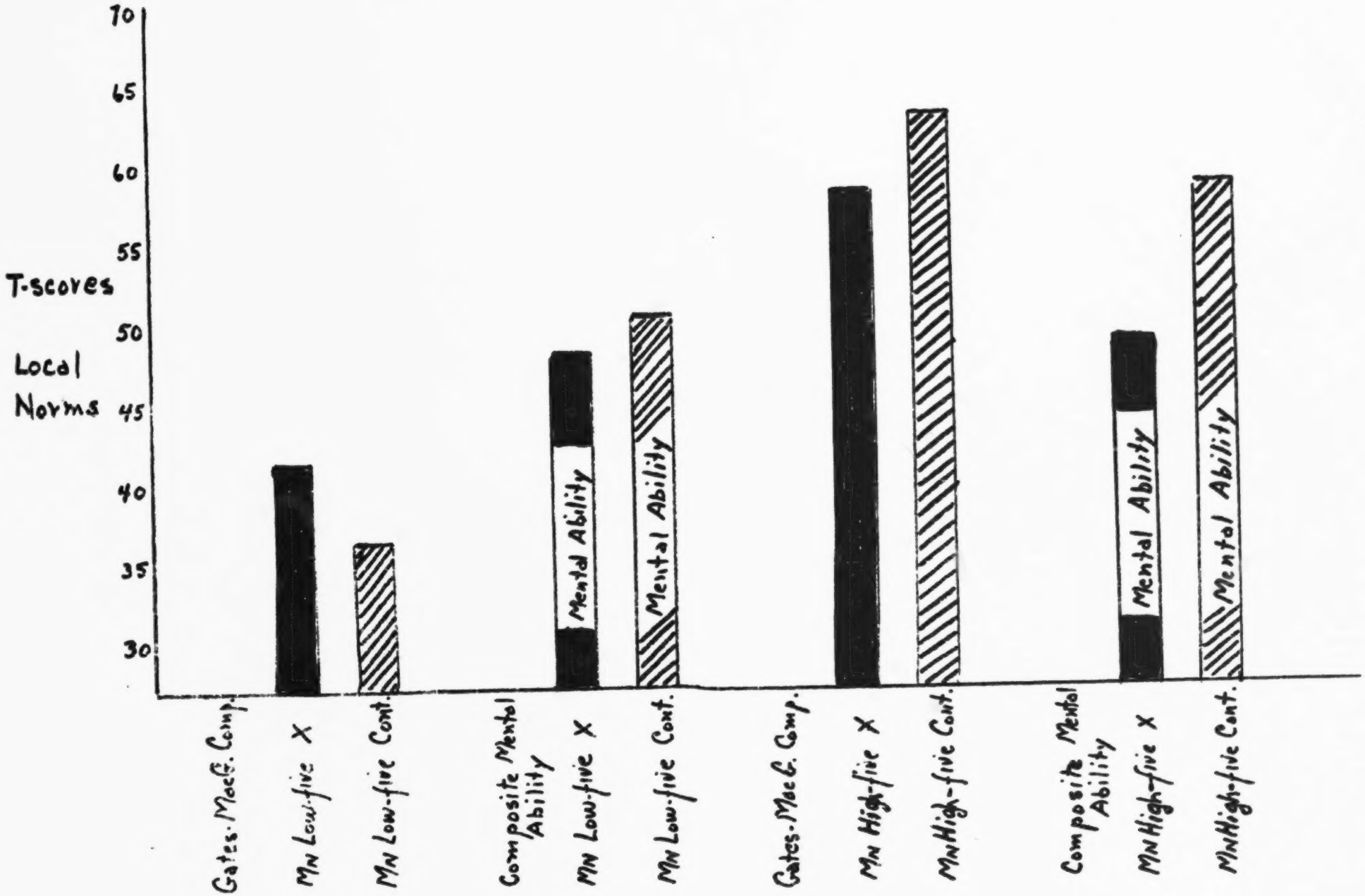


Table IX

Comparison of Sub-groups

A. Gates Mac-Ginitie Comprehension Test -- 1968 T-Scores

	Experimental	Control
Lowest 5 children	Mn. 41.8 S.D. 6.16	Mn. 37.2 S.D. 5.20
Highest 5 children	Mn. 58.4 S.D. 4.2	Mn. 63.4 S.D. 4.47

B. Composite Mental Ability T-Scores

	Experimental	Control
Lowest 5 children	Mn. 46.8 S.D. 5.29	Mn. 50.6 S.D. 4.41
Highest 5 children	Mn. 48.6 S.D. .32	Mn. 58.0 S.D. 4.89

C. Putnam Spelling Tests

Three spelling tests were developed for this project for Grade I and three tests for Grade II. (Appendix B). List I was composed of words common to both programs, List II contained words which are phonetically regular and List III was composed of words from the Dolch List. The lists were scrambled so that each of the three tests contained an equal number of words from each list. At the end of Grade I, June 1967, the experimental group was notably superior on List II, while the control class was significantly superior on List III. There was no significant difference between the classes on the total scores, although the control class was slightly superior (Table X).

By the end of Grade II, 1968, the experimental class scored higher on each list. The experimental class was significantly superior ($P=<.05$ level) on the total score.

It should be noted that the significant superiority of the experimental class in spelling, does not take into account the fact that it is slightly lower in mental ability than the control group. Therefore, the obtained level of significance at $<.05$ is probably a minimal determination of the true difference between the classes in spelling ability.

Figure II shows that the experimental class was achieving above their mental ability in spelling at the end of both Grade I and Grade II. The control class was achieving below their mental ability at the end of Grade I and Grade II.

Table XI shows that the experimental class had fewer children making one or more reversals at the end of Grade I, but the difference was not significant. Continuing this trend at the end of Grade II, the experimental class had significantly fewer children making one or more reversals (Chi Square = 7.53, $P =<.01$ level of significance).

Figure II

Putnam Composite Spelling Test

Experimental and Control Classes Compared - Total Scores

Converted to T-scores

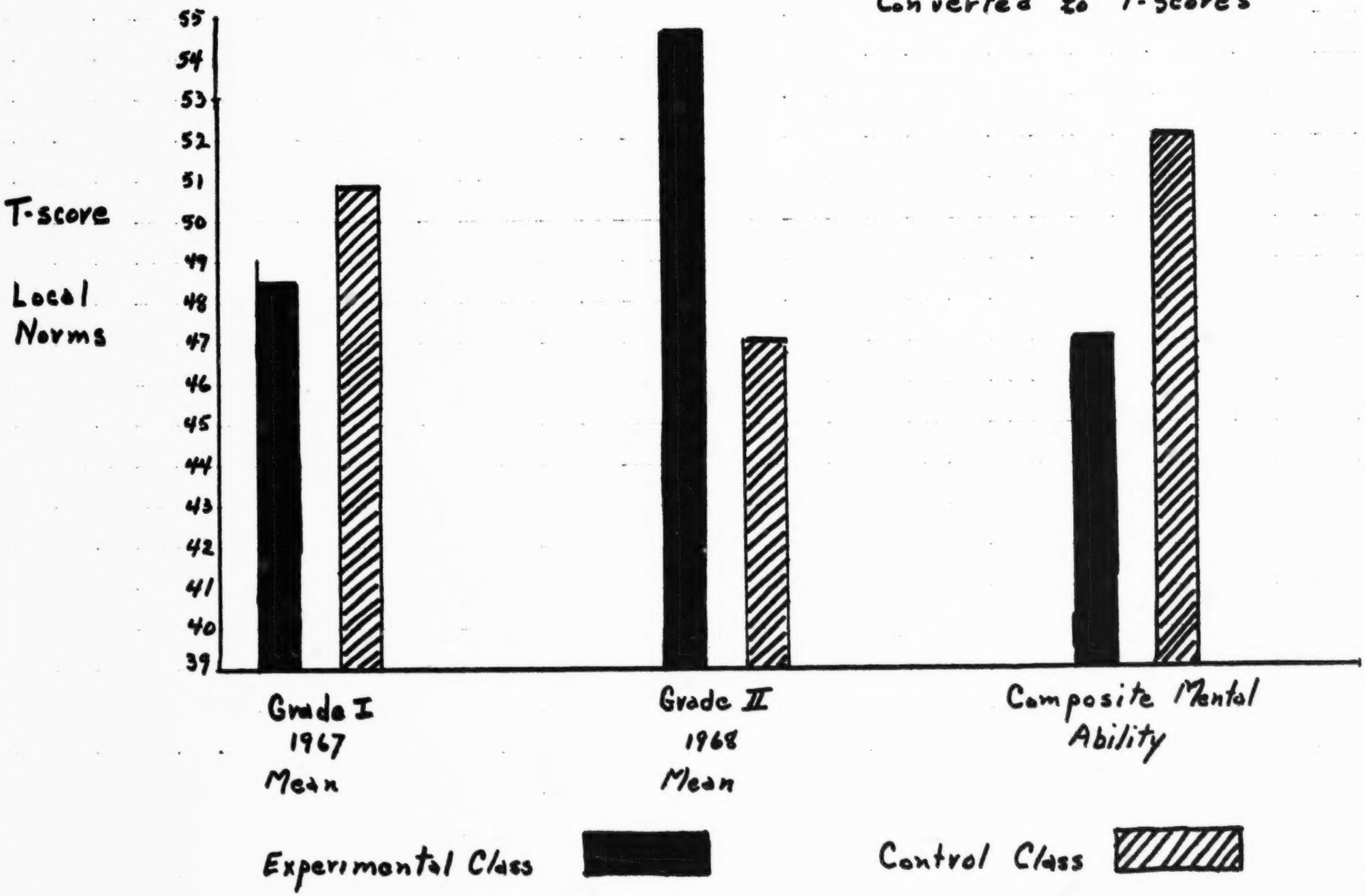


Table X

Putnam Composite Spelling Tests

		Grade I Spelling Tests 1967 List I† (raw scores)	List II	List III	Total Mn (raw scores)	Spelling Score Mn (T-Scores)	S.E.M.	t value
Experimental Class (N=17)	Mean	6.41	5.07	1.88	13.35	48.52	1.10	
	S.D.	1.41	2.10	1.16		7.75		1.33
Control Class (N=17)	Mean	6.18	3.94	4.53	14.06	50.88	2.87	
	S.D.	2.37	2.88	1.58		11.87		

		Grade II Spelling Tests 1968						
Experimental Class (N=17)	Mean	7.06	7.41	7.65	22.12	54.71	1.82	
	S.D.	1.95	1.65	1.36		7.52		2.53
Control Class (N=17)	Mean	5.94	5.29	5.65	16.88	47.07	2.41	
	S.D.	1.91	2.93	1.11		9.92		

†List I --Words common to both programs
List II --Words phonetically regular
List III --Dolch Words Lists
P=<.05 level of significance

Tendency Towards Reversals in Spelling
Experimental and Control Classes Compared

	Experimental (N=23)	Control (N=25)
1967 Putnam Composite Spelling Test Children who had one or more reversals	12	20

	Experimental (N=17)	Control (N=17)
1968 Putnam Composite Spelling Test Children who had one or more reversals	5*	12

*Chi Square 7.53 P=<.01 level of significance

D. Comparison of Groups on Writing Ability

1. Method of Administration

Two sets of stimulus pictures were prepared to elicit free writing from the children. This first set was composed of pictures resembling those in the Structural Reading Series. The second set resembled those of the Basal Readers. Both sets were group administered. In Test I each child had an individual copy about which he was instructed to write. Set II was projected on a screen where it remained until every child had written as much as he chose to write. When a child indicated he was finished, he was encouraged to write further. See Appendix C for stimulus pictures and directions.

2. Method of Scoring and Composition of Tests

The writing samples were analyzed by independent scorers to determine the number of complete sentences, the total number of recognizable words, and the number of words in the longest sentence for the sample. The findings based on Writing Sample I showed that the experimental class was significantly superior to the control class in the total number of words written at the end of Grade I. However, the pictures were closely allied to first grade work in the Structural program so only Writing Sample II (Pictures oriented to the Basal) was used in the Grade II test series.

Normalized T-Scores were set up for the populations available in 1967 (Grade I) and again in 1968 (Grade II).

3. Results for Writing Sample II are presented in Table XII and Figure III. At the end of Grade I there was equivalent writing ability on all measures for the Basal-type stimulus pictures of Writing Sample II. By the end of Grade II, June 1968, the experimental class was consistenly superior to the control class on all measures of writing ability and approached significant superiority in total number of words written ($F = 3.357$ $F.95(1.40) = 4.17$).

More revealing was the fact that in total number of words written at the end of Grade II the control class averaged only 4.4 more words than they wrote at the end of Grade I while the experimentals wrote an average of 10.4 more words than at the end of Grade I. These differences, however, are not statistically significant.

4. Critical to the hypothesis of the project is the writing performance of the five lowest readers. Table XIII and Figure IV show that, although these children (five children from each class) produce only a minimum of writing, the experimental sub-group is consistently superior to the control sub-group.

An analysis of the performance in writing and mental ability of these five lowest children of each class shows that the number of words written correlates highly with any measure of mental ability in the experimental class (Rho= $+.50$ to $+.70$). The exact opposite occurs in the control sub-group where the same measure of writing ability correlates negatively with every measure of mental ability (Rho = $-.50$ to $-.70$). There are children of fair competence in mental ability in the control class who are functioning very poorly on the writing tasks.

Table XII

Writing Sample II
Grade I 1967 and Grade II 1968 Results Compared

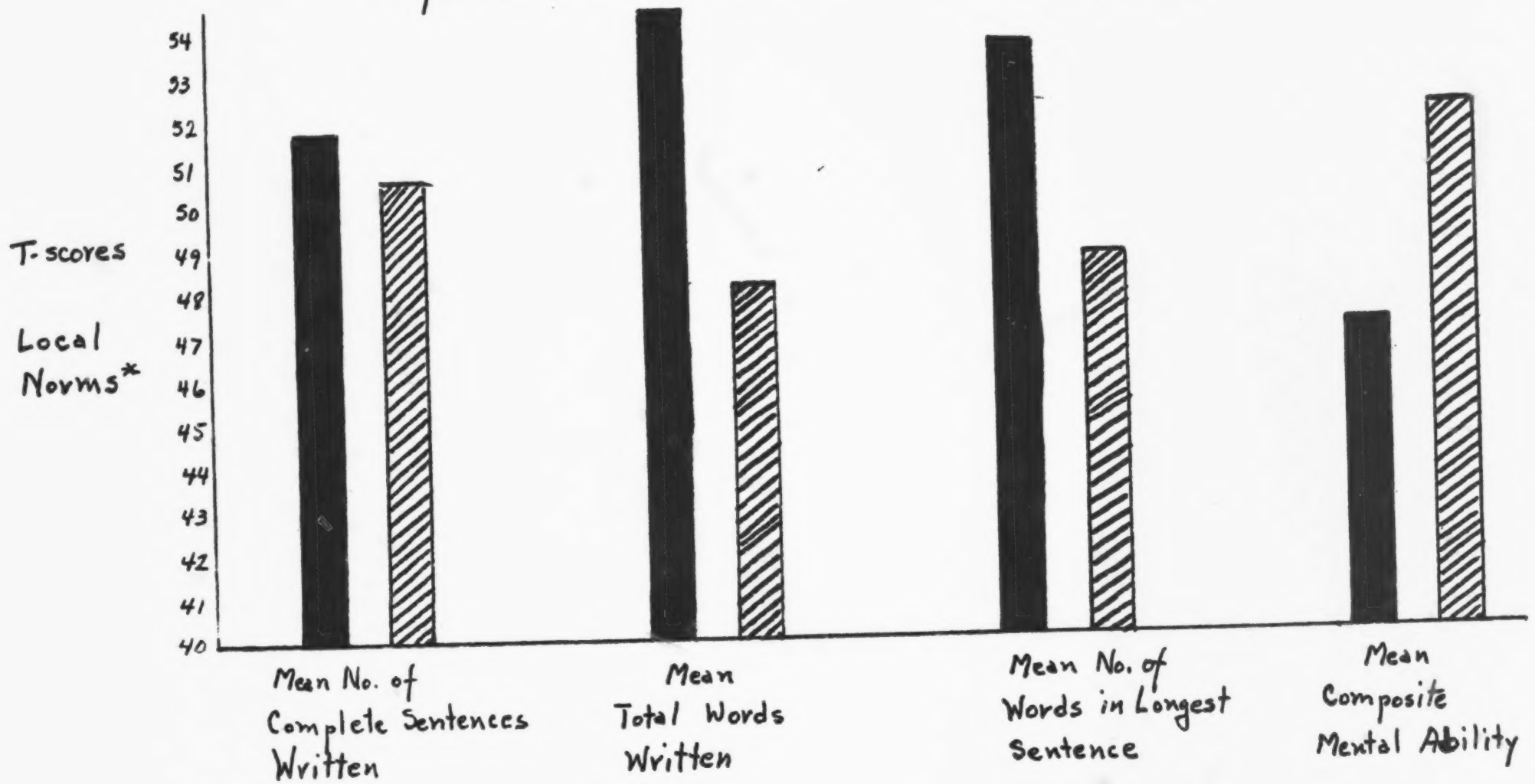
	Experimental Class (N=16)	Control Class (N=17)
Number of Complete Sentences Written -- 1967	4.06	3.12
T-Score Mean*	51.38	47.23
S.D.	8.92	11.04
Number of Complete Sentences Written -- 1968	4.50	3.76
T-Score Mean	51.81	50.76
S.D.	7.70	11.22
Total Number of Words Written -- 1967	22.0	21.59
T-Score Mean	50.12	49.29
S.D.	9.11	11.70
Total Number of Words Written -- 1968	32.44	25.00
T-Score Mean	54.50†	48.2†
S.D.	9.53	10.03
Number of Words in Longest Sentence -- 1967	4.50	4.65
T-Score Mean	39.37	40.41
S.D.	5.66	8.25
Number of Words in Longest Sentence -- 1968	8.38	6.88
T-Score Mean	53.75	48.88
S.D.	9.79	10.59

*T-Scores for Grade II Writing Sample N=42 in standardization group

†Difference between experimental and control classes t=1.837
P=<.07 level of confidence (two-tailed test)

Figure III — Analysis of Writing Sample II - Grade II - June 1968

Experimental and Control Classes Compared



*T-scores for Grade II Writing Sample N = 42
T-scores for Composite Mental Ability N = 53

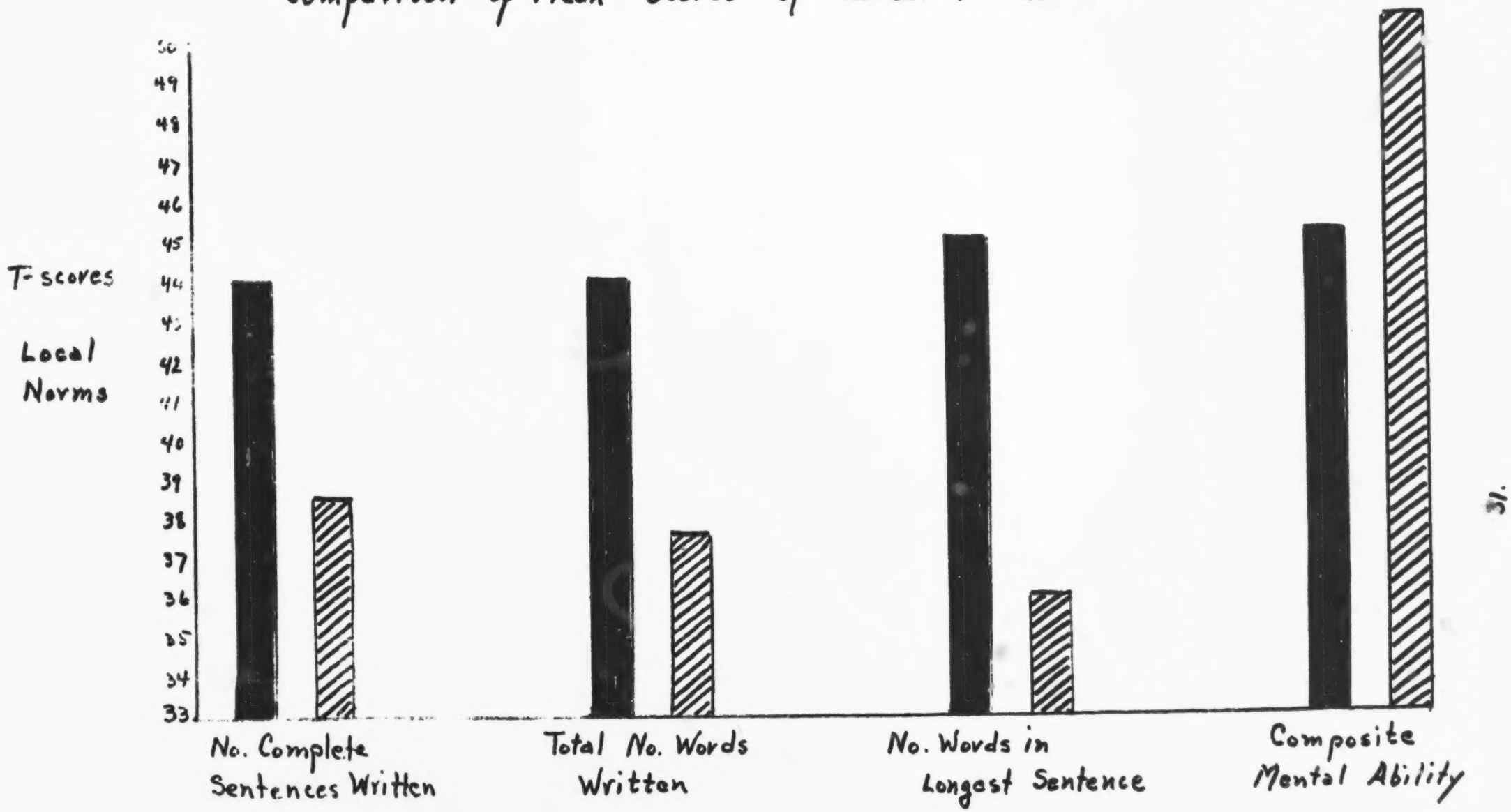
Table XIII

Writing Sample II
Sub-groups Compared -- Lowest Five Readers
in Each Class -- Grade II 1968

	Experimental Class (N=5)		Control Class (N=5)	
Number of Complete Sentences Written	Raw Score Mean T-Score Mean	3.0 44.0	Raw Score Mean T-Score Mean	2.0 38.6
Total Words Written	Raw Score Mean T-Score Mean	19.06 44.0	Raw Score Mean T-Score Mean	12.03 37.6
Number of Words in Longest Sentence	Raw Score Mean T-Score Mean	6.02 45.0	Raw Score Mean T-Score Mean	3.08 37.0
Composite Mental Ability (N=s)	T-Score Mean	45.2	T-Score Mean	50.6

Figure IV

Writing Sample II - 1968
Comparison of Mean Scores of Lowest Five Readers*



Experimental Class - Lowest-Five Readers

Control Class - Lowest-Five Readers

* based on Lowest-Five in Gates-MacGinitie Reading Comprehension Test.

E. Comparison of the Experimental and Control Classes on the Illinois Test of Psycholinguistic Abilities

Four measures from the Illinois Test of Psycholinguistic Abilities were selected to represent factors which were especially stressed in either the Basal or the Structural programs. It was hypothesized that the experimental class would have made greater gains in the auditory tests while the Basal class would show superiority on a visual perception item. The ITPA tests were administered individually (and alternately) to children of the two groups in May 1968. Each class had experienced one year and six months of the respective reading programs before the psycholinguistic assessment.

The selected measures from the ITPA follow:

1) The Auditory Vocal Association Test consisted of items such as, "I sit on a chair, I sleep in a_____."

2) The Visual Motor Sequencing Test required that the child reproduce by memory a series of pictures or geometric figures in correct sequence after having observed the experimenter set out the series.

3) The Auditory Vocal Sequencing consisted of repeating a series of digits after the experimenter had given the example.

4) Auditory Decoding consisted of answering correctly such questions as, "Do apples fly? Yes or No.".

The results for these measures are presented in Table XIV. These disadvantaged children were approximately one standard deviation below the standardized norms of the ITPA population in three of the four tests administered. Only in Auditory Vocal Sequencing did they approach the ITPA norm. No significant differences were found between the groups although the experimental class averaged distinctly higher on Auditory Vocal Sequencing. Figure V shows the group comparisons after the T-Score means have been adjusted through an analysis of covariance to control the Composite Mental Ability contribution to the differences between the groups. These results suggest that the auditory concentration required in digit memory may have been improved as a result of experience in the Structural program. In accord with the hypothesis, on the Visual Sequencing Tests, the control class was slightly ahead, and on an over all combination of auditory measures the experimental class was slightly superior. However, in no case were these differences statistically significant.

Table XIV — Illinois Test of Psycholinguistic Abilities -- Selected Items

Experimental and Control Classes Compared

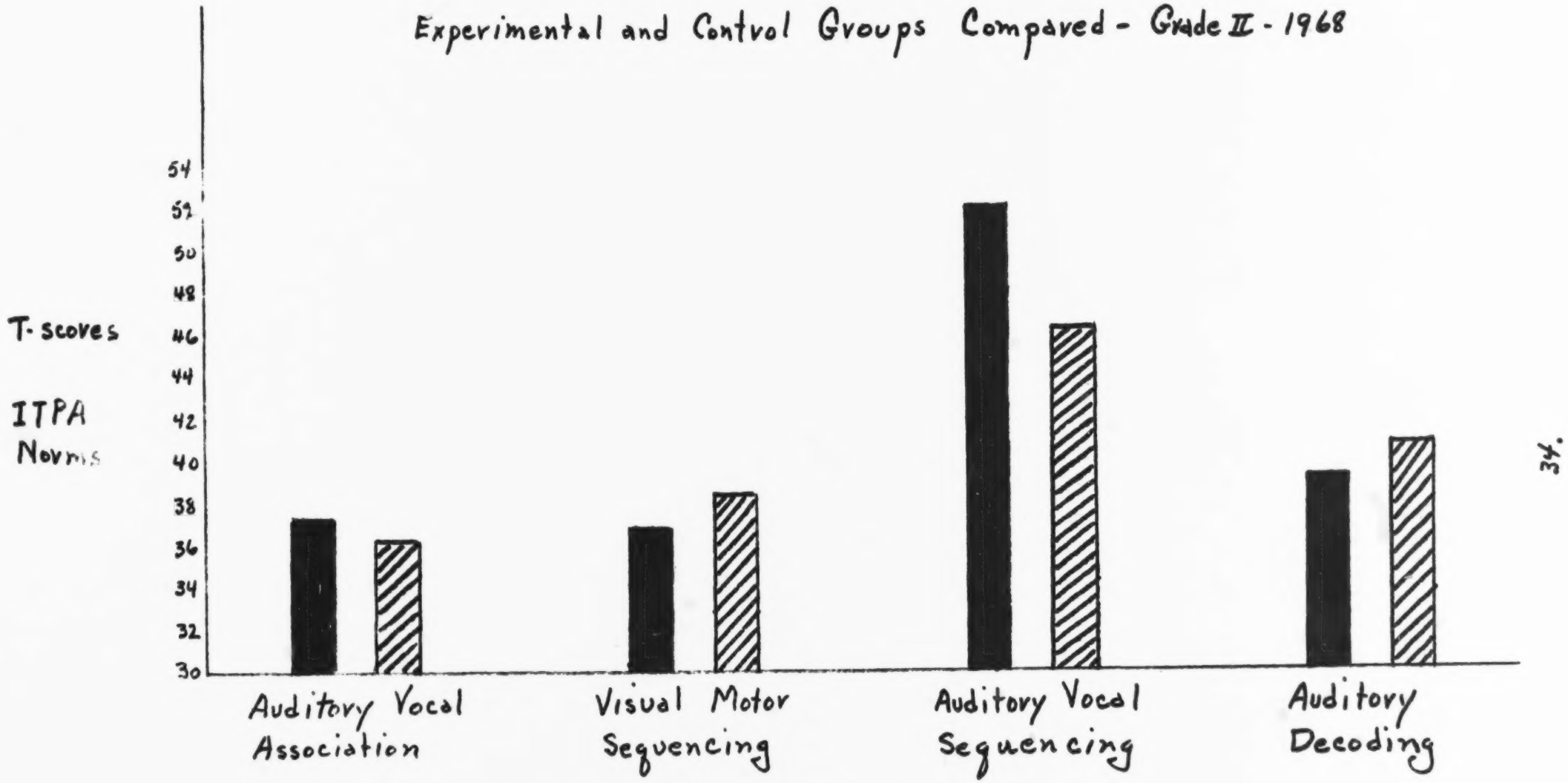
	Experimental Class (N=17)	Control Class (N=17)
Auditory Vocal Association		
ITPA Standard Score Mean	-1.43	-1.13
T-Score Mean	35.12	38.71
S.D.	9.17	10.78
Adjusted Mean*	37.59	36.21
Visual Motor Sequencing		
ITPA Standard Score Mean	-1.36	-1.15
T-Score Mean	36.65	38.76
S.D.	4.41	7.94
Adjusted Mean*	36.83	38.57
Auditory Vocal Sequencing		
ITPA Standard Score Mean	+.20	-0.22
T-Score Mean	50.71	47.71
S.D.	7.55	10.67
Adjusted Mean*	52.03	46.37
Auditory Decoding		
ITPA Standard Score Mean	-.85	-.90
T-Score Mean	40.59	40.0
S.D.	10.63	10.44
Adjusted Mean*	39.61	40.99

* T-Score means adjusted by analysis of covariance to remove the influence of mental ability difference between the two groups.

Figure V

Illinois Test of Psycholinguistic Abilities- Selected Tests

Experimental and Control Groups Compared - Grade II - 1968



Adjusted Means - Mental Ability Controlled

Experimental Class ▬▬ Control Class ▨

F. Qualitative Differences in the Structural and Basal Reading Program

1. Attitude Interview

An Attitude Interview, suitable to be administered to first grade children, was employed at the end of Grade I (17). The children in the experimental and control classes were shown a sequence of stick pictures and asked, "Which boy(girl) is the most like you?". The directions to the children and pictures are included in Appendix D.

2. In analysis of the results only question #5, which called for a choice between coloring pictures and writing words and stories, showed a distinct difference between the experimental and control groups. Sixty-four percent of the children of the experimental group chose to write stories at the end of Grade I compared with thirty-nine percent of the controls.

At the end of Grade II, when the interview was administered again, seventy-six percent of the experimentals compared with forty-one percent of the control children preferred to write words and stories instead of coloring pictures. A chi-square analysis shows this difference to be statistically significant ($P < .05$ level). This finding is supported by the evidence shown previously that the experimental children actually do write more than the control children when given an opportunity.

3. Although the following observations cannot be completely separated from the characteristics of the individual teachers, the investigators and supervisory staff of the school made the following observations:

a. The auditory training of the Structural program tended to develop more attentive listening habits.

b. The program sequence of the Structural series required the children to progress and master each step in turn before proceeding to the next level of development. This process was aided by the supplementary materials prepared by the teachers and the consultant.

c. If children did not know a word or phrase, the experimental class was taught "to figure out" by using the skills previously learned rather than to guess. This had several consequences: the children could work effectively alone at their desks;

it reduced "guessing" to a minimum; it encouraged children to "do their own work" rather than copy from their classmates; and, in the individual testing sessions, the children showed deep concern that they had given the correct response.

In contrast, the children of the Basal program evidenced richer vocabulary and more spontaneous reactions. In accordance with the school practice, much of the reading program was conducted with the whole class, (a "homogeneously" selected class) rather than in small groups. In such a setting it was possible for the poorer reader to participate minimally in reading practice. It is possible that these children were potentially too disorganized to work alone but differences in grouping practice may be very influential.

d. The administrative staff observed the progress of the two classes and expressed the opinion that both classes were being taught by effective teachers but that the Structural program gave the experimental children effective word analysis skills and a stronger language foundation which would benefit them in later academic achievement.

e. The experimental class teacher was taxed with the addition of nine low-achieving first graders in her second grade class who were taught as a separate group in addition to the experimental children. In spite of these difficult conditions, she preferred the Structural program to the Basal which she had previously used. (see letter in Appendix E)

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VIII. Discussion

This pilot project culminated in the comparison of two classes of seventeen children each. Sampling errors could be so influential that the study can only be regarded as exploratory -- but exploratory in an area of much significance for the education of disadvantaged urban children.

Certain of the results call for explanation. A discussion of the following questions will give the necessary perspective for evaluation of the pilot study.

1. Were the experimental and control groups similar enough to warrant the comparisons?

   After the loss of approximately one third from each class, it is surprising that the final groups are as comparable as was shown in Table I. The major difference is in sex distribution. The control class has 10 boys and 7 girls while the experimental class has 10 girls and 7 boys remaining from the original allocation. The possibility was studied that the superiority of experimental groups was due to the often reported higher performance of girls in early school achievement. Averages were found for boys and girls. The factor of possible maturity of the girls was apparently offset by the finding that the boys in this project had slightly superior mental ability.

   Although the control group was only slightly superior to the experimental group on the Lee Clark Reading Readiness Test the comparability of the two classes was most challenged by the finding that the control class was significantly superior to the experimental class on the California Test of Mental Maturity.

2. How may the significant differences in California Test of Mental Maturity in favor of the control class be explained?

   The C.T.M.M. was administered to the two classes after the first year of the reading program. The superiority of the control class was found in language and, even more distinctively, in the non-language sections. This result might be accounted for in one of the following three ways:

   1) The free-guessing and procedures which were encouraged in Basal reading program may have taught the control class to work at a faster pace and increased both their visual-perception and their problem-solving skills. Working more deliberately, desiring to "figure out" each choice correctly, the experimental group obtained lower scores.

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2) There is evidence that at the end of the first grade the children trained in the Structural program were unable to score competitively because the Gates-MacGinitie Reading Test was so dependent on the Basal vocabulary. This same limitation in vocabulary may be operative, in the C.T M M It is also possible that the Basal program offered richer experiences and a wider range of activities which resulted in superior performance on this test.

3) The Basal program encouraged free-guessing and word recognition based on any available clues. In contrast the experimental class was taught not to guess but to take pride in figuring out the words without help. In the group testing situation the Basal class could have looked on each others' papers and "borrowed" much more frequently. There were sources of evidence which suggested that "borrowing" was going on and might account in part for the superior performance of the control group on C.T.M.M. Two of these sources of evidence follow:

   a) When children who were absent on the day of the test, took "make-up" tests in small groups, the investigators observed and took steps to reduce the "copying". The arrangement of seats in the control class permitted more "copying" since the seats were clustered together in rows in the center of the room. On the other hand, the experimental children were seated around the edges of the room in an open square.

   b) On the two individually administered measures of mental ability, the Kent and Block Design, in which the children had no opportunity to help each other, only slight differences in favor of the control group were obtained.

In summary, the control group children engaged in mutual help and exploited any available clues. They had more opportunity to see each other's papers. In the individually administered tests of mental ability no significant superiority of the control class was found.

On the assumption that "borrowing" was practiced more extensively in the Basal class there would be a different effect on the various achievement measures previously reported. Since the Illinois Test of Psycholinguistic Abilities was individually administered, there would be no effect. The Writing Sample test would be very little affected. Spelling could be influenced by "borrowing". If the control class average was increased by this means, it was still significantly lower than that obtained by the experimental class. However, on the Gates-MacGinitie Reading Test exactly the same conditions were found (e.g. "mark the correct word" -- easily seen from a distance) as on the C.T.M. If copying from the more capable classmate was more common in the control class than in the experimental class, then the finding that there were no differences in Gates-MacGinitie Reading scores may be erroneous. An individually administered reading test might show that the experimental class was superior in reading achievement.

If the "borrowing" is more characteristic of children taught by the Basal program, then the results obtained in other investigations of early reading achievement need to be reassessed.

3. <u>Are the teachers different enough to account for the findings without reference to method?</u>

The teacher variable is a major uncontrolled factor in this exploratory study. In retrospect the investigators agree that both teachers had excellent relationships with the children. Both were friendly to the children but could be clearly directive on occasion.

The teacher of the control class was more experienced than the experimental teacher. She had a Masters degree and many years of effective teaching of disadvantaged children. She was black as were the children in her class in a school in a riot-torn area of Newark. In contrast, the experimental teacher was young. She had only taught for one year prior to the beginning of the experiment. She was white, but the black children showed no sign that she was classified by them as a "whitey".

Both teachers were proud of the accomplishments of the children. Both, on occasion, revealed an exasperation with the poor performance of a low achieving child. Both encountered the many problems of teaching in a poverty area.

The Structural program provided many more opportunities for games and for children to receive applause and approval from both teacher and classmates. Opportunities for trips, experiments, and wider ranging discussions were more evident in the Basal class. These differences may have been less related to teacher variable than to the demands made in the specific teaching conditions. The teacher of the Structural class taught four separate reading groups each day necessitated by the additon of nine poor readers to her second grade class. The teacher of the control class usually taught reading to the total class at once, and had three first grade children transferred into her class.

4. Were the methods by which the classes were taught characteristic, respectively, of the Structural program and the Basal method?

The Structural program was taught in a manner which adhered strictly to the directions given in the manual. Both the letter and the "spirit" of the program were carefully followed. Since the author of the Structural program served as the Consultant, she had the opportunity to observe the class frequently and to guide the teacher in every detail.

The teacher of the Basal method taught very much in accordance with the Basal manual. One major deviation was the teaching of the class "en-masse" rather than in traditional groups. Supplementary enrichment consisted of film strips of the Basal content, which were prepared by the School Principal, and some supplementary phonics.

5. To what extent was the "Hawthorne effect" operating in favor of the experimental class?

The investigators' efforts to balance visitors. interest in the children's progress, and reading-associated trips has been incorporated in the description of method. In spite of research related efforts it was evident that the experimental class received more visitors and sensed that they were in some way "special".

The effect on the experimental results, however, may not have been entirely beneficial. Children may be distracted by visitors as well as stimulated by them. In addition the control class was in a "special" situation. The school staff was proud of the quality of education it was able to provide for these children of a poverty area. A new and different way of teaching reading was rather threatening in spite of the genuine desire to cooperate. To supplement the current Basal method with integrated materials or additional phonics would not have created any problem. The Structural method of teaching reading is really different and this major difference means that it cannot be amalgamated into the current practices. The control-class teacher was well aware of the hazards attending inadequate research and she was eager to show how well the children were learning under the current reading program. It was clear that she spurred the control class on to high achievement in a way which seemed to match the encouragement received by the experimental class.

In retrospect both classes were experiencing the special benefits of a "Hawthorne effect" but it is impossible to make a definitive appraisal.

6. In evaluating the findings of this study, what procedures might be expected to check or clarify the results?

The major finding of no differences in reading competence on the Gates-MacGinitie Reading Tests requires further study. This could be done in three ways:

1) A study to check the amount of "borrowing" in group administered tests by disadvantaged children studying by the Basal method could be conducted. This could determine whether "borrowing" inflated the control class scores.

2) By testing these children at the end of Grade III by individually administered tests of reading ability, it could be seen whether the accelerated progress of the experimental class during Grade II is continued and later exceeds the competence of the control class.

3) An assessment at the end of the second year of two pairs of "matched classes" (two classes of low average ability children and two bright groups) which have now completed Grade I in the respective reading programs would allow a check of the findings of the present study.

4) The analysis of the Grade I results from these additional classes would provide an answer to furthur questions:

   a) Are the results of the present study confirmed under different teachers?

   b) Are the significant superiorities in spelling ability and preference for "writing words and stories" confirmed?

   c) Do increased numbers of subjects produce statistically significant findings in writing and psycholinguistic abilities where the results of the present study "approached" significance?

   d) Are the qualitative differences in favor of the Structural class confirmed and can certain advantages of the Basal program be more adequately revealed?

5) Would a longitudinal study (through Grade VI) reveal significant differences in achievement and/or attitude towards academic work?

7. <u>What are the possible long-term effects of the benefits which appear to be associated with use of the Structural program in teaching reading to disadvantaged children?</u>

The Structural program emphasizes listening and writing skills in meaningful contexts. By training in reading components the children have the experience at the beginning of Book B of suddenly discovering that they can read, as also reported in Stein and Gould (17). Intrinsic to the program are games, training in independent word attack skills, and applause from

the group for successful accomplishment. By acquiring a secure foundation the low-achieving children progress slowly but steadily through the reading program without frustration or discouragement, even when other children forged ahead of them. Approximating an individualized program, it has the advantage, when adequate supplementary work sheets are available, of providing the necessary remediation within the normal sequence of learning.

Certain benefits of this program have been revealed in the reported results. The long-term effects may be cummulative, reflecting many aspects of the Structural approach:

1) Having been protected against the hazards of guessing incorrectly, the children have experienced school as a more reinforcing experience.

2) The emotional impact of the discovery that they can read may create a long term favorable attitude toward themselves and schooling.

3) The increased listening skills may produce, not only greater learning competence, but also greater orderliness and attention within the classroom.

4) The focus on linguistic accuracy in speaking and hearing will overcome, to some extent, the seriously faulty articulation and vocal casualness which tends to perserverate within the Basal program. The Basal program emphasized visual perception even after phonic supplements are added.

5) When the language of the school is treated as a second language, these disadvantaged children are capable of adequate discriminative learning within the Structural program,and retention of the color and intimacy of their own speech for out-of-school occasions.

6) The Basal program encourages trips and demonstrations in developing experience charts for early reading. Even though these "experience charts" are not used in the Structural program until Grade III, the trips and demonstrations themselves could be a base for group discussion activities in the Structural class but not for direct reading experiences.

7) The demonstrated stronger language arts foundation of the Structural reading program would tend to reduce the need for remedial teachers giving special instruction and to keep even low-achieving readers moving steadily forward in developing their reading competence.

8) Children whose auditory and verbal skills are weak and whose early schooling does not create language competence, are likely to fall behind in educational progress. Truancy and other forms of "missing" school will produce a cummulative effect of scholastic disability even among children of normal intellectual potential. The whole situation breeds discouragement for both children and teachers. On the basis of the findings of this study, it appears that, adequately developed, the Structural program could significantly improve disadvantaged children's ability to cope with their school requirements, and progress in accordance with their intellectual potential.

IX. Conclusion

A multi-variate comparison of the augmented Structural and an enriched Basal program of teaching reading to disadvantaged urban children has shown that, at the end of Grade I, the level of scoring on reading tests is influenced by the test selected with respect to the components of the training program. By the end of Grade II there were no differences between the two classes in the Gates-MacGinitie reading achievement. However, the five poorest readers of the Structural class were slightly superior to the five lowest readers of the Basal class. The accelerated reading progress of the Structural class during their second grade suggests the possibility of comparatively greater progress during the third grade.

There was evidence that a more secure foundation in the linguistic aspects of language had been achieved by the Structural class. This was shown by the significantly higher attainments of the Structural class at the end of second grade in spelling, and their consistent superiority in measures of writing performance. The auditory emphasis of the Structural program is reflected in the superior scores on Auditory Sequencing of the Illinois Test of Psycholinguistic Abilities.

The Structural class also showed a significantly better attitude towards academic work and task oriented activities. This improved attitude may have far reaching consequences on later academic achievement.

The significant superiority of the Basal class on the California Test of Mental Maturity cannot be readily interpreted under the conditions of the present project. Clarification could be obtained by further study.

Although the teacher of the experimental class was most enthusiastic about the method and used supplementary worksheets there were still insufficient numbers available to suitably augment the Structural program for these low ability children.

In the interest of adequate interpretation it will be important to see how the classes compare at the end of Grade III. With an anticipated loss of about one-fifth of the children each year it becomes necessary to add the data from additional "matched" classes which have already completed Grade I in the respective programs at Eighteenth Avenue School.

The limited number of children in this pilot project necessitates utmost caution in interpretation, but the present evidence bears out the hypothesis that disadvantaged urban children taught reading by the augmental Structural program gain a better foundation in certain language skills and are more participant in academic endeavors than are the children taught by the enriched Basal method.

X. Summary

This study was predicated on observed inadequacies in the traditional Basal program for the teaching of reading to disadvantaged children. The investigators selected the augmented Structural Series (Stern and Gould) as providing training in skill components minimized in the Basal texts. An exploratory multi-variable comparison of the Structural and an enriched Basal (Winston) program was conducted with two "matched" classes of low-average ability disadvantaged children with the same teachers through Grade I and Grade II. Classes were matched initially in Reading Readiness scores, teacher ratings, sex, age, and intact families. The evaluation measures were: Gates-MacGinitie Reading Tests -- Vocabulary and Comprehension, Structural Reading Achievement Tests, Spelling (Putnam Composite Tests), Writing Samples, selected items from the ITPA, California Test of Mental Maturity, Kent Emergency Scale, WISC, Block Design and an attitude interview (Youtz-Habas Attitude Interview).

At the end of Grade I, 1967 the Basal class (control) was significantly superior in Gates-MacGinitie Comprehension Test and California Test of Mental Maturity. The Structural (experimental) was significantly superior in the Structural Reading Achievement Test and in number of words written in the Writing Sample. There were no significant differences in the other measures.

At the end of Grade II, 1968, only 17 children out of 27 remained in each class for final comparisons, Significant differences were found in favor of the Structural Class in spelling ability, and in expressed desire to write words and stories instead of coloring pictures.

Although not reaching significance, distinctive superiority of the Structural class was again found in number of words written in the writing sample and in scores on the Auditory Sequencing Section of the ITPA. On the tests of mental ability, C.T.M.M.-Language and Non-Language, Kent Scales, and WISC Block Design, the control class was consistently superior to the experimental class. Alternate interpretations of this finding are presented in the report.

By using analysis of covariance to provide a control for the superior mental ability of the Basal-group, adjusted mean-reading-scores on Gates-MacGinitie tests were slightly superior for the Structural class. Adjusted mean comparisons of the other measures in the study showed the Structural class to be superior on all except the Visual Sequencing test of the ITPA. However, F-tests based on the analysis of covariance were statistically significant only in Spelling Ability.

A limited comparison of sub-groups (lowest five in each class) showed consistent superior achievement of the Experimental sub-group in Gates-MacGinitie Reading Test -- Vocabulary and Comprehension. and in all measures of the Writing Sample, despite the fact that the Control Sub-group scored higher in mental ability.

The study recognized the exploratory nature of the project, limited sampling, and problems of uncontrolled variables such as teacher differences. However, the evidence of growth on the part of the experimental class in language components and favorable academic attitudes and work habits suggest that the Structural method would provide a stronger foundation in language skills for these disadvantaged urban children.

Specific Recommendations:

1. A retest of academic abilities should be conducted with the experimental and control children at the end of Grade III.

2. The children in the additional matched classes in Eighteenth Avenue School, Newark, who have completed Grade I, should be retested during Grade II with the addition of individually administered reading tests to eliminate the possibility of "borrowing" from more competent classmates. In addition, the complete WISC should be administered to all children in Spring 1969.

3. Decisions in regard to a more extensive study should be deferred until the evidence from Recommendations 1 and 2 is available.

4. The augmentation of the Structural Reading program as initiated in this study, should be continued and made available for public purchase.

5. The films taken of the Experimental classes in operation should be appropriately edited and supplementary guides provided to make possible effective teacher training in the Structural method, before an extensive research is feasible.

6. A future study of interest would be a compariosn of the multivariate effects of the following programs: i.t.a., Structural Program, Lippincott Basal and a more traditional Basal.

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XII. Appendix

A. Structural Reading Tests (developed by Mrs. Toni Gould, author of the Structural Reading Series)

A-1 Word Comprehension -- Form B^1
A-2 Sentence Comprehension -- Form B^1
A-3 Paragraph Comprehension -- Form B^1
A-4 Word Comprehension -- Form B^2
A-5 Sentence Comprehension -- Form B^2
A-6 Paragraph Comprehension -- Form B^2

B. Putnam Composite Spelling Tests

B-1 Grade I -- 1967
B-2 Grade II -- 1968

C. Writing Sample

C-1 Directions: Writing Sample
C-2 Writing Sample I -- Stimulus pictures
C-3 Writing Sample II -- Stimulus pictures

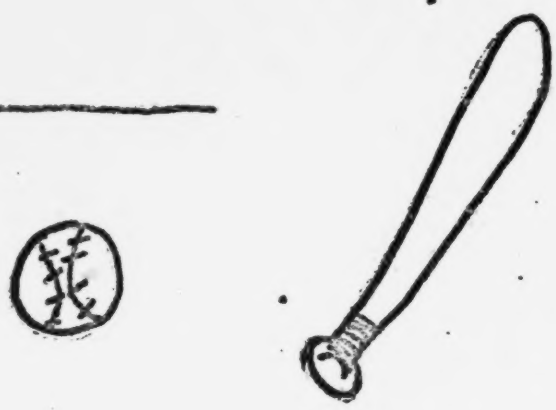
D. Youtz-Habas Attitude Interview

E. Letter from Mrs. Tetta

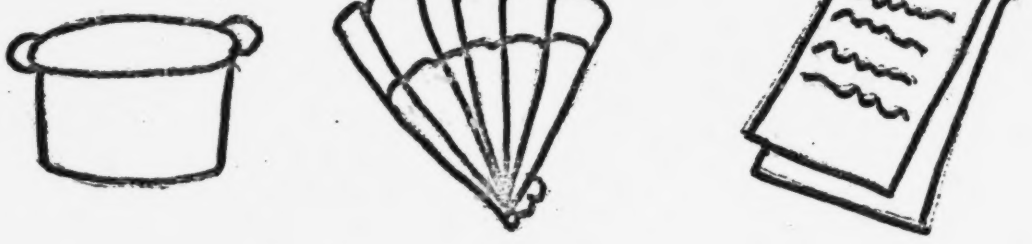
A-1 SRI - B

Word Comprehension

bat



pan



pin

dish

six

6

9

Circle the picture that goes with the w

A-2

SRT

Sentence Comprehension-B_1

Ann has a fan.

Jan is sick.

Don has a bib on.

Bob has a big fish.

Mom has a mop and a pan.

Jim put his hen in a box.

The children are to read the sentence and

A-3

SRI-B1
Paragraph Comprehension

Tim has a hat and
a bat. Put an X
on the hat.

The big pot has a
lid.
Put an x on the pot.

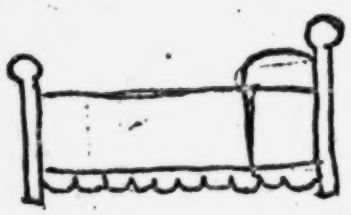
This is Ann. Give
Ann a doll.

This is Bob. Bob
has an ax and a kit.
Put the ax in the kit.

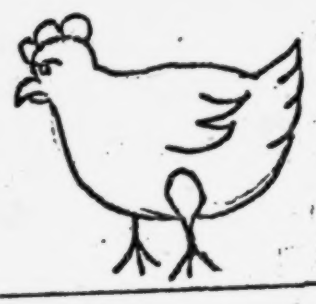
This is Bill. Give Bill
a tin ship.

A-4

Word Comprehension



beg bed Ben



hot hut hen

men mop mud

cup cat cot

not net nut

To the teacher: The children are to look at the picture and encircle the correct word it represents to the right.

p.6

Sentence Comprehension

Ann has a fan.

Tim has a bat.

Jan is sick.

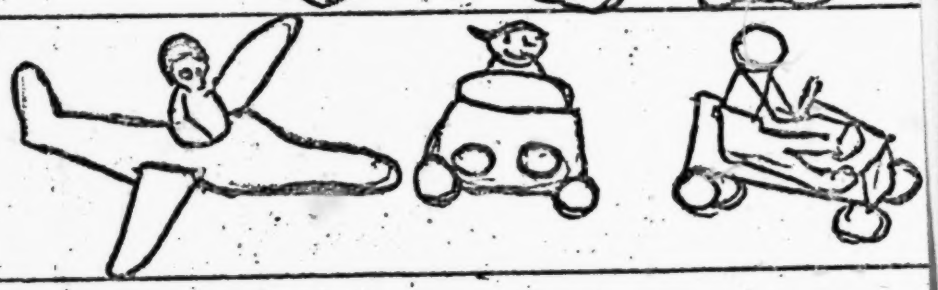
Jim has a big fish.

Mom has a mop and a rag.

The pup is in the mud.

The doll has a hat and socks.

Ben is in a big jet.

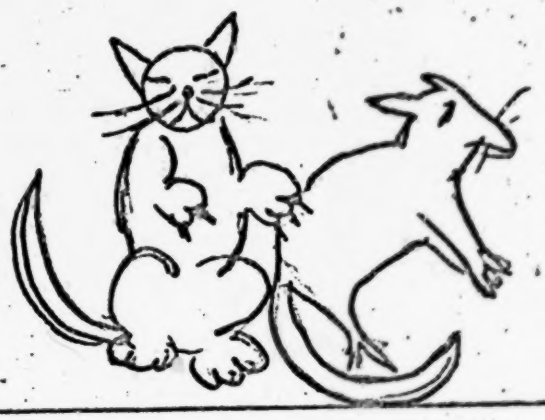


The children are to read the sentence and encircle the picture it describes.

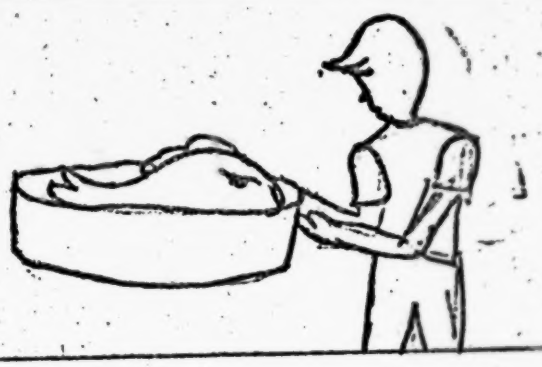
A6

Paragraph Comprehension

he cat has a rat.
he rat is fat.
t an x on the cat.



Bill has a fish. Bill
out it in a big dish.
Put an x on the dish.



Bob has a box. Bob
can sit on his box.
Put an x on Bob.

Don has a gun and a
sack on his back. Put
an x on the sack.

Peg has a pet. It
is a hen. The hen
has an egg. Put an
x on Peg.

B-1 Putnam Composite Spelling Test -- 1967

Spelling Test to be administered to Mrs. Davis' class, using the Winston Basal Series, and to Mrs. Tetta's class, using the Singer Structural Reading Program.

Composition of the Test

List I -- 9 words selected that are common to both series.

List II -- 9 words that are strictly phonetic.

List III -- 9 words selected from the Dolch Word List, which are commonly taught at Pre-Primer, Primer, or Grade I levels.

These 27 words were scrambled in their presentation to prevent failure of either group with either list.

Directions: Pronounce word. Use it in the sentence given. Pronounce word again. Give each test on separate days.

	List I	List II	List III
Test I	1. box	2. got	3. the
	4. sit	5. and	6. play
	7. cat	8. had	9. with

Test II	3. ran	2. at	1. come
	6. hat	5. pin	4. jump
	9. bag	8. did	7. ride

Test III	2. put	1. not	3. in
	5. bat	4. on	6. see
	8. can	7. run	9. go

Test I

1. box	A big box.	box
2. got	He got a ball.	got
3. the	The red house.	the
4. sit	Please sit down.	sit
5. and	Paper and pencils.	and
6. play	Play with the ball.	play
7. cat	A big black cat.	cat
8. hat	Put your hat on.	hat
9. with	Come with me.	with

Test II

1. come	Come and play.	come
2. at	At the house.	at
3. ran	The dog ran fast.	ran
4. jump	Jump up and down.	jump
5. pin	Pin the cloth.	pin
6. hat	Put your hat on.	hat
7. ride	Ride the bike.	ride
8. did	We did the work.	did
9. bag	Carry it in a bag.	bag

Test III

1.	not	She is not here.	not
2.	put	Put the ball down.	put
3.	in	Come in here.	in
4.	on	Sit on the chair.	on
5.	bat	Hit the ball with a bat.	bat
6.	see	See me go.	see
7.	run	Run very fast.	run
8.	can	Can you swim?	can
9.	go	Go home now.	go

B-2 Putnam Composite Spelling Test -- Grade II -- 1968

Spelling Test to be administered to Mrs. Davis' class, using the Winston Basal Series, and to Mrs. Tetta's class, using the Singer Structural Reading Program.

Composition of the Test

List I -- 9 words selected that are common to both series.

List II -- 9 words that are strictly phonetic from both series

List III -- 9 words selected from the Dolch Word List.

These 27 words were scrambled in their presentation to prevent failure of either group with either list.

Directions: Pronounce word. Use it in the sentence given. Pronounce word again. Give each test on separate days.

	List I	List II	List III
	1. man	2. sled	3. ten
Test I	4. red	5. five	6. up
	7. milk	8. fish	9. tell

---

	3. car	2. lost	1. best
Test II	6. make	5. game	4. went
	9. step	8. time	7. stop

---

	2. three	1. ring	3. going
Test III	5. first	4. think	6. help
	8. train	7. trick	9. fire

Test I

1.	man	He is a man.	man
2.	sled	Ride on my sled.	sled
3.	ten	I have ten balls.	ten
4.	red	Red flowers are pretty.	red
5.	five	Jump five times.	five
6.	up	Go up in the air.	up
7.	milk	Milk is good to drink.	milk
8.	fish	The fish is in the water.	fish
9.	tell	Tell me a story.	tell

Test II

1.	best	You can do it best.	best
2.	lost	I lost my ball.	lost
3.	car	Ride in my car.	car
4.	went	We went to the store.	went
5.	game	Let's play a game.	game
6.	make	Make a pretty picture.	make
7.	stop	Stop the car.	stop
8.	time	It is time to get up.	time
9.	step	Step down here.	step

Test III

1.	ring	Ring the bell.	ring
2.	three	I have three apples.	three
3.	going	We are going to the store.	going
4.	think	I think I can go.	think
5.	first	It is your turn first.	first
6.	help	Please help me.	help
7.	trick	The dog can do a trick.	trick
8.	train	Ride on a train.	train
9.	fire	A fire is hot.	fire

WRITING SAMPLE II

Directions:

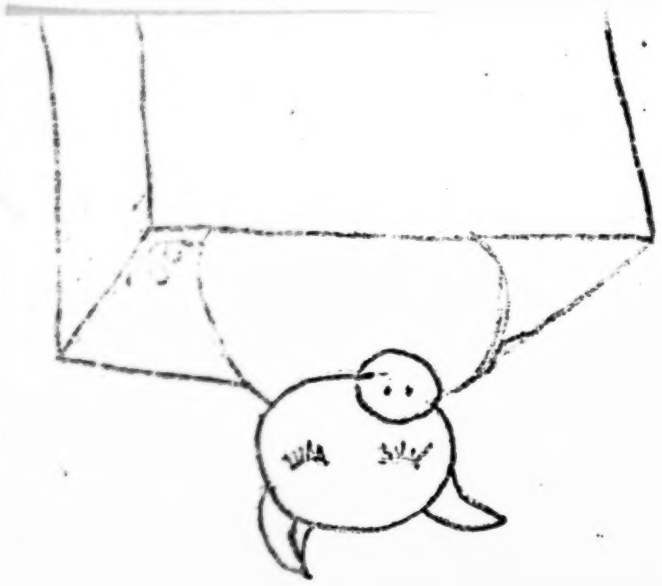
Here are some pictures. Look at each picture carefully. See all the things in the pictures. See what is happening in each picture.

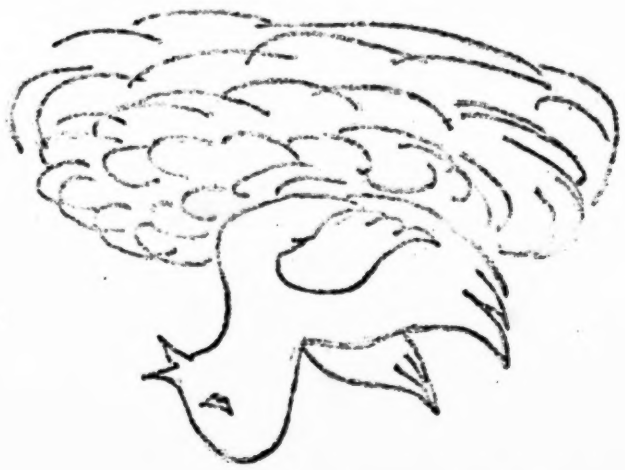
Now choose a picture. Write about it. You may write words or sentences or even write a story.

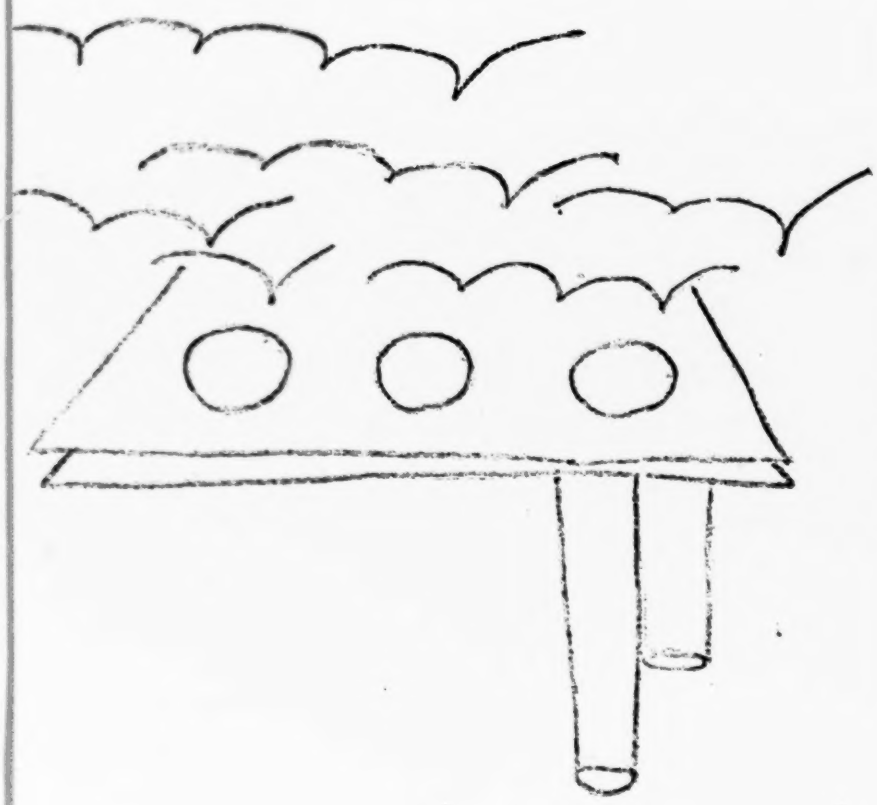
When you finish with one picture, choose another picture and tell about that one.

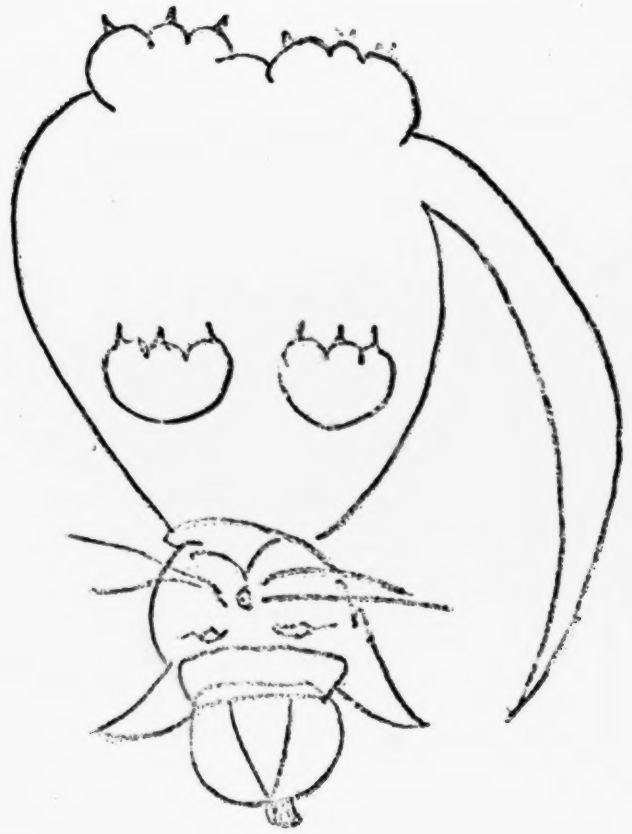
If you finish on one side of your paper you may turn it over and write on the other side.

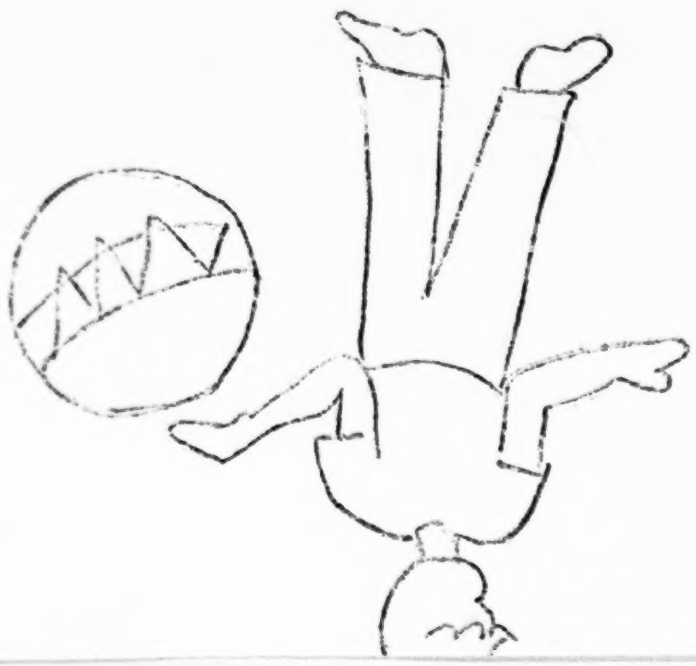
(When a child puts his pencil down, or appears to have finished, ask, "Would you like to write about another picture? ").

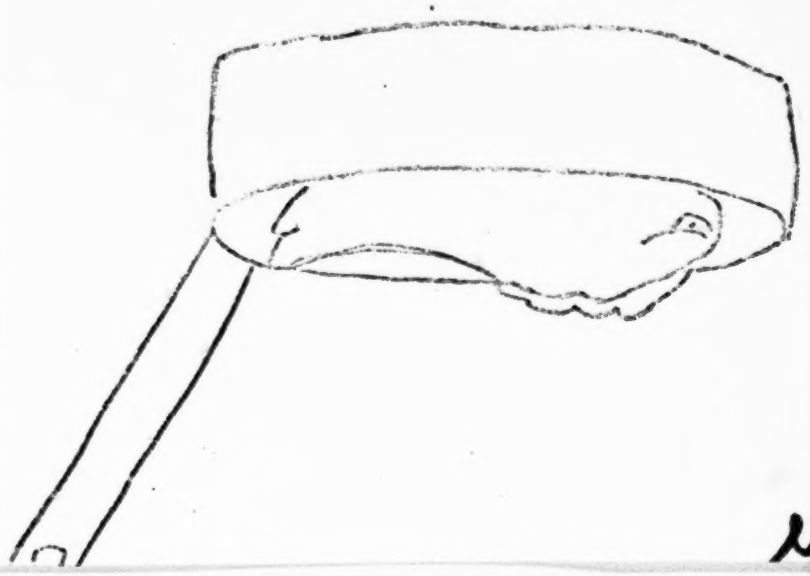


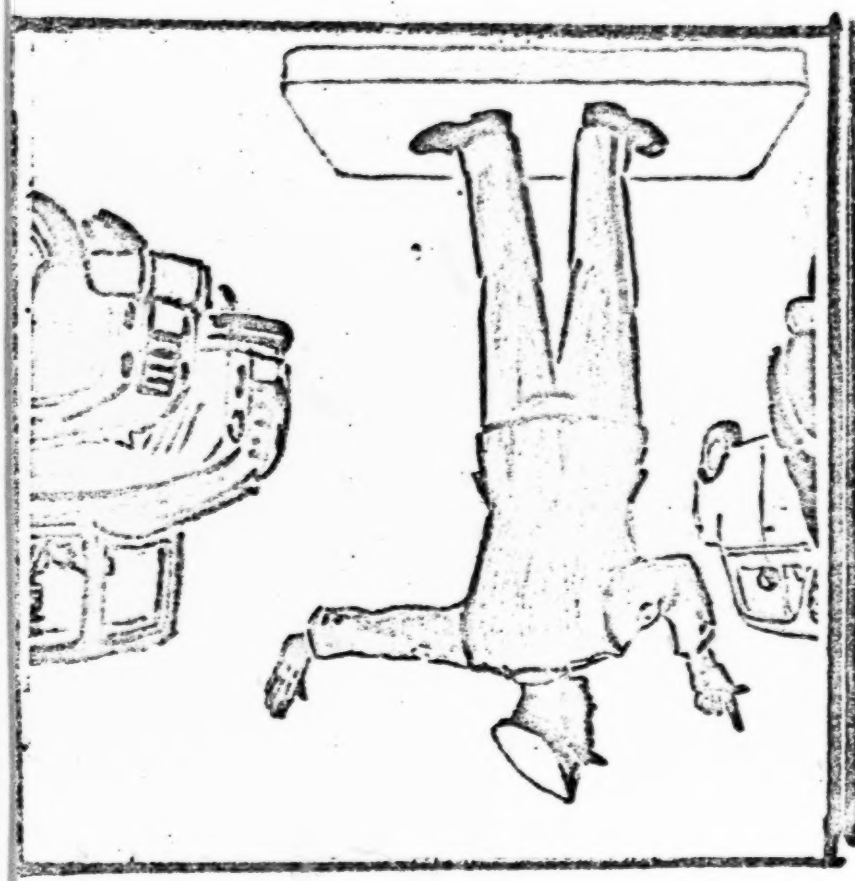


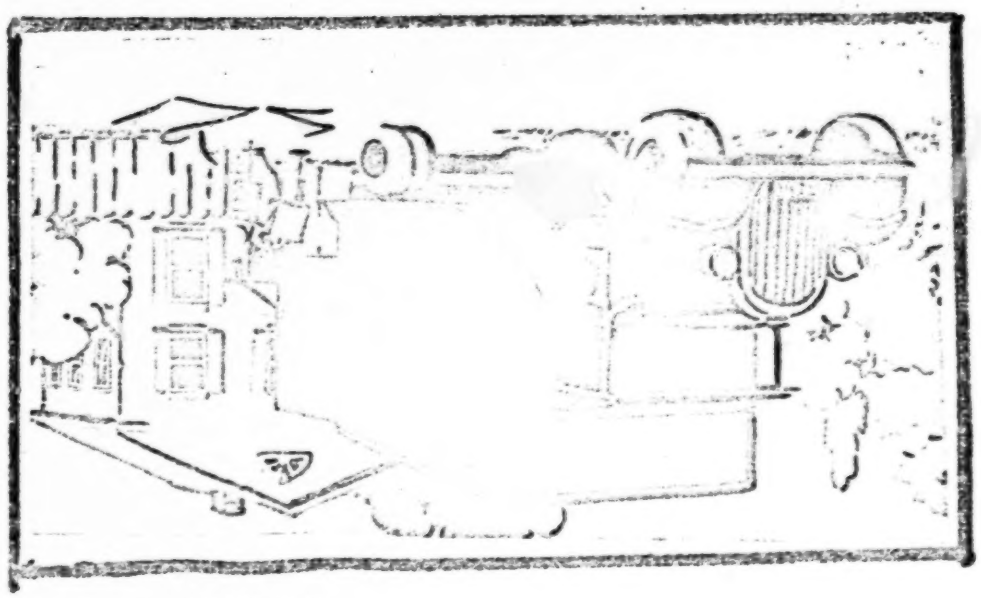


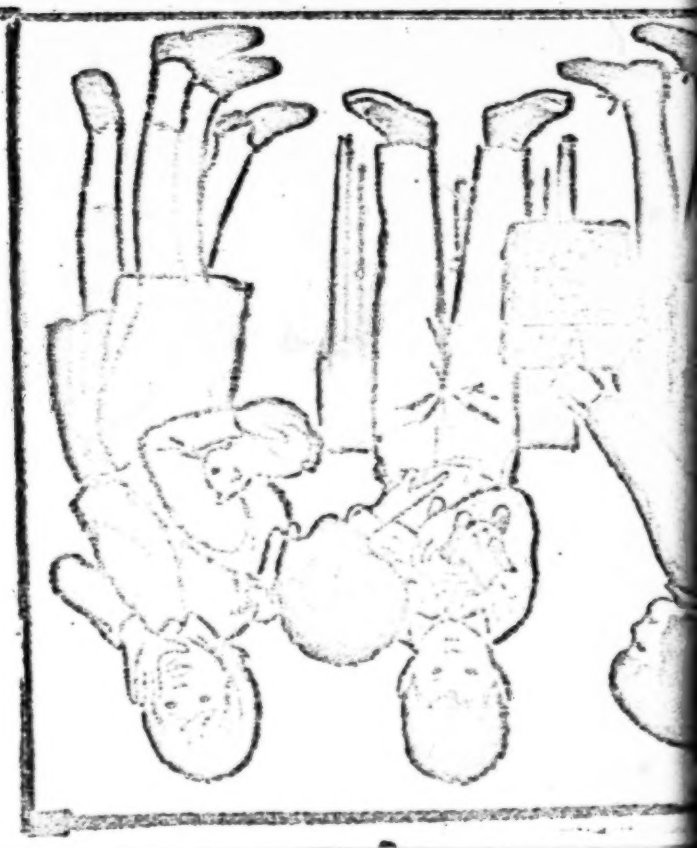












Youtz- Habas Attitude Interview *

Primary Form - June 1967

1. Control item. Lead-in story - "Do you remember snow? In the winter we have snow sometimes. These boys are going to tell us how they feel about snow."

   1) This boy likes to play out in the snow.
   2) This boy doesn't care one way or the other. He doesn't care whether it snows or not.
   3) This boy doesn't like snow at all.

   Which boy is most like you?

2. "Here are some children going to school."

   1) This boy likes school very much, he's hurrying to get there.
   2) This boy knows he has to go to school. Sometimes he likes to go, but sometimes no.
   3) This boy doesn't want to go to school. He wants to stay outside.

   Which boy is most like you?

3. The teacher says, "You can now choose what you want to do. Either cut out pictures for your scrap book or read ahead in your reading book."

   1) This boy wants to cut out pictures more than do reading.
   2) This boy likes to cut out pictures and he likes reading. He can't decide which he wants to do.
   3) This boy wants to go ahead in his reading book more than cut out pictures.

   Which boy is most like you?

4. "This boy just had a birthday. He got a present. When he opened the package it was a book.

   1) This boy was glad to get a book. He sat down to read the book right away.
   2) This boy is glad to get a present, he doesn't care what is in the package.
   3) This boy wanted a toy. He did not want a book in his package.

   Which boy is most like you?

5. "Sometimes at school the children color pictures and sometimes they write words and stories."

   1) This boy likes to do different things but he wants to color pictures most.
   2) This boy likes to color pictures and to write words and stories. But he doesn't know which he wants to do most.
   3) This boy likes to do different things but he wants to write words and stores most.

   Which boy is most like you?

* Developed for this project by Dr. Adella Youtz and Mrs. Sylvia Habas.

6. The teacher says, "Open your books to a new lesson today. We have some new words to learn."

1) This boy does not want new words. He wants to read the words he knows.
____ 2) This boy will try to read the new lesson. The hard words he will learn next year.
3) This boy likes to see new words. He can figure out the new lesson.

Which boy is most like you?

7. Here are some boys walking home from school. They are talking on the way.

1) This boy says, "#### The children in my class like to play. They sometimes play when it is time to work. "
2) This boy says, "The children in my class like to play. Only one or two children play when it is time for work."
3) This boys says, "The children in my class like to play. When it is time for work, they all do their work."

Which boy is most like you?

8. Where are these boys? Yes, the boys are sitting on the steps in front of their house. They are talking about people, - grown up people.

1) This boy says, "There are lots of mean people. They are mean to children."
2) This boy says, "I don't know whether people are mean or not. I guess some people are mean and some are kind. "
3) This boy says, " Most people are kind to children; there's just a few that are mean."

Which boy says it the way you think it's true?

9. Where do you think these boys are? What are they doing? They are thinking. This is what they are thinking.

1) This boy is thinking, "My teacher thinks I am very good in my school work. "
2) This boy is thinking, My teacher thinks I can do good work when I really try."
3) This boy is thinking, "My teacher thinks my school work is very hard for me."

Which boy is thinking like you?

10. The children went on a picnic in the park.

1) This boy just loves hot dogs. He eats a lot of them.
2) This boy will eat a hot dog, but he wants other things to eat too.
3) This boy doesn't like hot dogs at all. He says, "Give me hamburgers, cheese, peanut butter - anything, as long as it's not a hot dog."

Which boy is most like you?

E.

Report of the Teacher of the
Experimental Class:
Mrs. Patricia Tetta

Being involved in a reading program such as Structural Reading has become one of the most valuable experiences towards enhancing my career as a teacher.

The enthusiasm, interest and initiative that the children display from being involved in it is something that can only be described as thrilling and satisfying to me, the teacher. The class worked so beautifully for two years. They never lost interest in learning to read. Their reading books were the first books they turned to when they came in, in the morning. During free time and afternoon recess, one can walk into room 202 and observe children completely engrossed in reading or trying to read, with the most priceless expressions on their faces. Truthfully there were many times I wished I had a camera. For instance, when a group or a child about to receive a new and more difficult book, anyone could see the thrill and desire to challenge another new experience. All this happened because no child in the room failed, they all knew how to do something in the program. The program does not allow for guessing and each child knew ways to attack vocabulary. Many times the children got such joy from attacking words they had never seen. They had certain tools they knew how to use. There were so many times when I would just observe groups working and just attacking words, and I became completely overjoyed.

The satisfaction and joy that a teacher receives at the end of a two year program, using this reading method, is overwhelming. In June, I watched a group of my children read a fourth grade basal reader, without any difficulty at all. In the two years that passed, I continuously listened to some of their speech patterns change. At least they know how to correct themselves if nothing else. I watched them write lovely stories, I listened while they read children's story books to the rest of the class. I watched their growth continuously and consistently and at the end I sat back and cannot express in actual words what I felt for my children. I still am bursting with pride. You see, I know every child in room 202 was learning and I could measure each and every individual's rate of learning. They also knew they were learning. This is more important, and even more important they wanted to learn so badly.

Structural Reading brought joy and happiness to these children. It taught them to read, but also important, it taught them routine and work habits. It taught them initiative, and to learn and try independently. It taught them to think and so much more it gave them an enormous amount of confidence which is what pushed them further and further.

When they were taught techniques to attack words, then a whole new world was opened to them.

As an inexperienced primary school teacher, I would not want to return to a traditional basal reader.

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800 ABSTRACT An exploratory multi-variable comparison of the augmented Structural and
801 an enriched Basal (Winston) program was conducted with two "matched" classes of
802 low-average ability disadvantaged children through Grades I and II. At the end
803 of Grade I the Basal class was significantly superior in Gates-MacGinitie Com-
804 prehension and C.T.M.M. The Structural class was significantly superior on the
805 Structural Reading Test and in number of words written in Writing Sample. There
806 were no significant differences in spelling, Gates-MacGinitie Vocabulary or items
807 of the attitude interview. Seventeen children remained in each class for compari-
808 son at the end of Grade II. Significant differences were found in favor of the
809 Structural group in Spelling Ability and desire to write stories instead of color
810 pictures. The Control class's superiority on measures of mental ability is given
811 alternate interpretations. Analysis of covariance with mental ability controlled
812 showed the Structural class to be equal or superior on measures of the study,
813 including reading, free-writing, spelling, and three of four sections of the ITPA.
814 Consistent findings in favor of the Structural group in reading and writing sample
815 are confirmed in a study of the progress of the lowest five readers in each class.
816 Despite certain uncontrolled variables, the evidence of growth of the Structural
817 class in language components and favorable academic attitudes and work-habits
818 suggests that the Structural method provided a stronger foundation in language
819 skills for these disadvantaged children.
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